PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Vol 109, No. 7 Thursday, August 17, 1939 Price Ten Cents

Two Paper Associations Indicted As Trusts

Kraft Paper Association and National Container Association Charged By Federal Grand Jury For Southern District of New York With Being Combinations In Restraint of Trade — Manufacturers and Others Named.

The Department of Justice announced on Tuesday that the Federal Grand Jury for the Southern District of New York which has been investigating the activities of trade association management firms and certain trade associations has returned two indictments charging violations of the Sherman Anti-trust Act.

One of these indictments charges the Kraft Paper Association, 35 corporations, and 14 individuals with having engaged in a combination and conspiracy to restrain interstate trade and commerce in kraft paper by curtailing and limiting the production of kraft paper and artificially maintaining and affecting the price of said commodity to the consumer. The second indictment charges the National Container Association, 12 regional container associations, 27 corporations, and 28 individuals with having engaged in a combination and conspiracy to restrain interstate commerce in corrugated and solid fiber board shipping containers by allotment of production among certain of the defendants and by artificially fixing and maintaining non-competitive prices for shipping containers.

Stevenson Corp. Named

The Stevenson Corporation, which, together with certain individuals, conducts the business of trade association management under the firm name of Stevenson, Jordan & Harrison, is named as a defendant in both indictments and is charged with having participated in both combinations and conspiracies through its management activities in connection with all of the associations named in both indictments.

In the first indictment, in addition to the Kraft Paper Association and the Stevenson Corporation, the following are named as defendants:

Corporations Named

(1) Corporations engaged in the manufacture of Kraft paper which are, or during the period covered by the indictment were, members of the Kraft Paper Association: Albemarle Paper Manufacturing Company, Brown Company, Calcasieu Sulphate Paper Company, Carolina Fibre Company, Central Paper Company, Champion Paper and Fibre Company, Chesapeake-Camp Corporation, Crossett Lumber Company (trading as Crossett Paper Mills), Crown Zellerbach Corporation (successor to Crown Willamette Paper Company), Filer Fibre Company, Gaylord Container Corporation, successor to Robert Gaylord, Inc., and Bogalusa Paper Co., Inc.), Gilman Paper Company, Gulf States Paper Corporation (successor to E-Z Opener Bag Company), Hollingsworth & Whitney Company, Hummel-Ross Fibre Corporation, Longview Fibre Company, Minnesota & Ontario Paper Company, Mosinee Paper Mills Company, Munroe Paper Corporation, Nashua River Paper Company, Nekoosa-Edwards Paper Company, Northwest Paper Company, Orono Pulp and Paper Company, Paterson Parchment Paper Company, St. Regis Paper Company, Sorg Paper Company, Southern Advance Bag and Paper Company, Southern Kraft Corporation, John Strange Paper Company, Tarentum Paper Mills, Inc., Thilmany Pulp and Paper Company, Tomahawk Kraft Paper Company, Union Bag and Paper Corporation, West Virginia Pulp and Paper Company, Inc.

Individuals Named

(2) Individuals alleged to have participated in the combination and conspiracy charged: William H. Anders, Joseph A. Auchter, Joseph H. Cowhill, John E. Alexander, H. Stuart Daniels, H. W. Ellerson, W. J. Henry, Scott M. Hudson, E. A. Kendler, R. A. McDonald, Charles R. Stevenson, J. L. Stille, Norman S. Stone, Blair B. Stringfellow, Jr.

In the second indictment, in addition to the National Container Association and the Stevenson Corporation, the following are named as defendants:

Regional Associations Named

(1) Twelve regional container associations affiliated with the National Container Association and operating under the management of Stevenson, Jordan & Harrison: New York State Container Association, Middle Atlantic Container Association, Allegheny Container Association, Ohio Container Association, Zone Seven Container Association (formerly known as Indiana Container Association), Michigan Container Association, Chicago Container Association, Piedmont Container Association, Southeastern Con-

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Many Educational Features at Fall Meeting

Exhibits Showing New Products, New Methods and Latest Equipment Will Supplement Technical Program, Mill and Laboratory Visits At National Meeting of Technical Association of Pulp and Paper Industry.

With the September 12, 13 and 14 dates for the national Fall Meeting of the Technical Association of the Pulp and Paper Industry at Syracuse, N. Y. rapidly nearing, announcements by the Convention Committee are stressing the educational features of the exhibits and mill visits which are in addition to the extensive program of technical papers.

New and improved testing devices for the laboratory as well as instruments and controls will occupy a large share of the exhibit space at Convention Headquarters according to early reports. Testing Machines, Inc., New York, will exhibit one of the latest variable speed drive Schopper tensile strength and elongation testers, together with the late model Schopper-Riegler beating and freeness tester, and the Schopper folding endurance tester. They also intend exhibiting their latest model micrometers, dead weight type, and scales.

Williams Apparatus Company, Inc., Watertown, N. Y. will display the Williams rapid pulp and paper testing outfit consisting of: heavy duty stock breaker and disintegrator, standard sheet mould, oil hydraulic press, electric sample mixer, precision freeness tester, electric sheet drier, high speed centrifuge and combination drying oven. All this equipment will be completely mounted upon a substantial composition steel asbestos table complete with wiring, water connections, etc. In addition, they will show other new instruments including: Williams Electric smoothness and formation tester, New Williams chip classifier, New Williams precision oil penetration tester as approved by A.S.T.M., new combination microscope and photomicrographic camera especially designed for fiber investigation.

W. & L. E. Gurley, Troy, N. Y. plan to have a complete display of their modern paper testing instruments including the original and improved Gurley Densometer with various attachments and timing devices. They will also show the Gurley R. D. smoothness tester, the Gurley R. D. stiffness tester, The Gurley-Hill S-P-S (softness-porosity-smoothness) tester, and the Cobb Sizing Tester.

HOWARD F. FARRINGTON
Treasurer

CARL F. RICHTER
Assistant General Chairman

Leeds & Northrup Co., Philadelphia will have in their booth a complete icromax ph recording controller which uses a glass electrode and operates valves through its own electric control valve drive.

Process Controls, Inc., LeRoy, N. Y. will have a very interesting exhibit. It will be a standard P-10 Meyers consistency controller, complete as sold to the mills. This machine is a logical development of two earlier machines designed by S. E. Meyers, Chief Engineer of Process Controls, Inc. Scores of the earlier machines are now being used under all sorts of conditions and all kinds of stock and are probably old friends to many TAPPI members. For this reason, the new machine is expected to create an unusual amount of interest, and more particularly because of its unique type of dilution valve control. The design gives a preciseness of movement which is equal to the finest instrument, but thoroughly rugged and trustworthy in everyday mill use. Of still greater interest, perhaps, is the fact that the rate of valve action may be varied to suit the conditions met with in order to obviate conditions so often met with in sensitive instruments. We understand that the hydraulically operated valve will be hooked up at the exhibit so you can see just what happens under changes in consistency. Also there will be a large sectional view of this valve from which you can see details of its unusual design.

The Will Corporation, Rochester, N. Y. plan to exhibit laboratory apparatus and glassware, particularly equipment for bacteriological testing of paper food containers. R. Fuess Inc., New York will exhibit their testing apparatus.

Bausch & Lomb Optical Co., Rochester, N. Y.

will show their paper technologist's microscope—a complete basic microscope equipment for the paper laboratory for use in fiber analyses of paper finishes; speck analysis, measurement of fiber lengths; beating characteristics of pulps; for particle size work on filler and other materials; for surface characteristics of paper, etc.; Greenough Wide Field Binocular Microscope for general inspection of paper surfaces, fibers, and raw materials, in a range of magnification from 7X to 150X, in accordance with TAPPI Standards; Model B. micro-projector for projection of microscope specimens in making measurements on various materials, for beater control and particle size study; B. & L large daylight table microscope lamp—for use in fiber microscopy where the most delicate stains are used and also for general color comparison work; B & L photoelectric opacimeter—for reading opacities in terms of TAPPI Standards of contrast ratio and printing opacity; B & L Photoelectric Glosemeter—this is a new product just being introduced and exhibited for the first time. Designed for reading the index of gloss on coated papers, comparison being made with a black carrara glass standard.

The Clay-Adams Company of New York will exhibit and demonstrate optical equipment for laboratory and research work in the Paper and Pulp Industry. The exhibit will include the Promar and Promi combination microprojection, drawing, and photomicrographic apparatus which has been used successfully for microscopic studies in the paper and pulp industries and also for starch and other film studies. Another feature of the exhibit will be a display of the Adams Microscope. Emil Davidson will be in charge of the exhibit.

Among the major oil companies, Socony-Vacuum has indicated that their exhibit will consist principally of petroleum products used for grease and blood-proofing, for water repellency, for softening, for providing greater absorbency, and for laying fuzz and eliminating curl. In addition to refined, crude scale and micro-crystalling waxes, soluble wax emulsions, softening and absorbency oils, and defoaming oils, lubricating oils and greases for every type of service will be displayed, and information as to their specific uses made available.

The Atlantic Refining Company plans to exhibit Atlantic 853 Waxemul. This is a solid, emulsifiable wax to be used as a sizing compound in the preparation of water-repellent papers. In conjunction with this display, they will have on exhibit several different types of paper in which waxemul is used and will, therefore, demonstrate the water-repellent qualities. Further, they anticipate being able to demonstrate the ease of emulsification. In addition to the Waxemul display, they will have on exhibition samples representing a complete line of Atlantic paraffine waxes.

R. J. CULLEN
President, International Paper Co.
Advisory Committeeman

FRANK C. ASH
Vice President, Oswego Falls Corp.
Advisory Committeeman

Rollway Bearing Company, Inc., Syracuse, N. Y. will have an exhibit containing various types of Rollway cylindrical roller bearings—both radial and thrust—showing specific applications for paper mill machinery such as jordans, press rolls, calender rolls. The exhibit will point out the advantages of the use of Rollway bearings.

Other exhibitors include Garlock Packing Co., Palmyra, New York; International Nickel Co., New York City; Morris Machine Works, Baldwinsville, New York; Morse Chain Co., Ithaca, N. Y.; Permutit Co., New York City; and Sandy Hill Iron & Brass Works, Hudson Falls, N. Y. The exact nature of these displays are not yet known to the Convention Committee.

Several nearby manufacturers of supplies and equipment for the paper industry have set aside days and hours during convention week for the entertainment of visitors who may wish to see the products being made at the plants. Gould Pumps, Inc. at Seneca Falls and Dilts Machine Co. at Fulton are among this group.

The program committee has set aside one afternoon for mill and laboratory visits and is further encouraging delegates to stop at designated mills and supply manufacturers on their way to and from the three day session. Plans are being made by the host plants for qualified escorts and the entertainment of visitors.

Increased activity was noted in the Japanese paper industry during the first quarter of 1939, as compared with the corresponding period of last year, the output of paper by the members of the Japanese Paper Manufacturers' Association showing a 3.3 per cent volume increase.

Improved Sales Encourages Chicago Trade

Good Fall Trade Is Seen In Current Improvement In Sales Volume For Many Grades of Paper As Tonnage For Converting Increases — Salesmen Plan Banner Outing—Paper Trade Supports Civic Move — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 14, 1939—A quiet July in the Chicago paper market is being followed by an August which is already providing enough improvement in tonnage to create expectations for good Fall business. Since the first of the month, converting tonnage is reported to have made definite improvement with envelopes and bank papers among the lines showing betterment. Locally, there is a feeling that merchant business will follow along shortly and that by early September demand will have reached a most satisfactory state.

Kraft offices report an encouraging firming up in the market while tonnage continues to be good. Book representatives say that the general market is quiet but that the ground is being laid for an appreciable increase what with demand slowly reaching the "better" stage. Sulphites are reporting more action since August 1, particularly in the better grades. Newsprint markets are more active and groundwoods have likewise shown a decided tendency to move upward since the beginning of the third quarter. Waste papers are firm and show a surprisingly definite strengthening within the past two weeks.

Paper Stock Market Shows Improvement

Some indication of the growing steadiness of the waste paper market is contained in current Chicago dealers buying prices which show the following ranges in the price schedule: mixed papers, .05@.10; No. 1 Mixed, .10@.15; folded news, .15@.20; box board, .10@.15; No. 2 book stock .20@.25; old containers, .20@.25; No. 1 book .30@.40; white news blank, .60@.70; No. 1 white shavings, .90@$1.15.

Dealers Cooperate in "Courtesy Week"

Chicago paper jobbers and dealers are planning to actively participate in Chicago's Courtesy Week Program which is to be held for the second consecutive year from August 27 to September 2. The Keep Chicago Safe committee, in conjunction with Chicago business, has arranged posters, bumper signs, bundle pasters, windshield stickers, stamps and instrument board tags to be given widespread usage to force attention of the fact that "courtesy saves lives." At the same time, the newspapers, radio and a series of speaking programs will be utilized to further develop interest in the program while certain "days" have been arranged wherein industry, the churches, schools and other units will be given the opportunity to carry out special programs.

New Safety Shield on Market

Of interest to paper mills, and particularly those with a well defined safety program, is the new "Dependon Safety Shield" being marketed by the Sellstrom Manufacturing Company of Chicago. The shield is, in effect, a small bay window through which the operator has unobstructed view. The window material is synthetic, made to withstand heat, sparks and acids and is removed from the face so as to allow perfect ventilation even for an operator who wears spectacles or goggles. The novel device is recommended especially for work at grinding or chipping operations with acids or hot liquids, at plating and degreasing jobs or for acetylene and spot welders.

Special Session for Unemployment Act

Industry with representation in Illinois will be interested in learning that the Governor is planning to call another "special session" of the Legislature hard on the heels of the closing of the 61st General Assembly July 1. This "special" will be used to bring the Illinois Unemployment Insurance Act into conformity with the recently approved changes in the Federal law, namely, in conforming the wages paid basis on both old age assistance and unemployment insurance and in exempting salaries over $3000 in computation of the job tax as is provided for in the Federal law. The Governor will also use the session to bring the old age pension program into line. Grave fears are, however, that the session will be largely given over to the always dangerous relief problem inasmuch as the city of Chicago is again facing a "relief crisis." There is a genuine belief that efforts will be made to increase taxes without comparable efforts being made to eliminate politics and waste from the administration of relief.

SAPI Plan Banner Outing

The midwest division of the Salesmens Association of the Paper Industry is making extensive plans to put over the biggest golf outing of the season at the LaGrange Country Club on Friday, August 25. According to Chairman George Craft, advance notice indicates a good attendance of paper executives who have been given special invitations to attend the outing. The appeal to the paper executives is also skillfully mixed in with the statement that the prizes will be of "executive" quality and plentiful as far as numbers are concerned, though arrangements will be made so that the least heralded salesman has an equal chance to cop the honors along with his boss. Swimming pool facilities of the LaGrange club are also coming in for a lot of attention although much of the interest over the August outing is being generated by the fact that two popular SAPEYE members, Jim Coy and Jack Burrus, are members of the host club. In fact, Jim Coy has sent out a personal invitation to the membership, an invitation that is certain to receive most cordial attention because of the high regard with which one of the "daddies" of the SAPEYES is held by the sales personnel of Chicago.

Windup September 21

Along with the news of the LaGrange outing comes the information that the "windup" affairs at Olympia Fields, held in conjunction with the fall outing of the National Paper Trade Association, has been definitely set for September 21 when plenty of extra features are scheduled.

Financial News of Pulp and Paper Industry

Modern Containers Makes Public Offer of Stock—Symington Committee Defers Sale of Abitibi Power and Paper Company Property — Moore Corp. Reports Increased Profits — National Container Earnings Rise.

New York Stock Exchange

High, Low and Last for the Week Ending August 16, 1939

	High	Low	Last
Armstrong Cork Co.	40¾	39⅞	40
Celotex Corp.	11½	10½	11
Certain-Teed Products Corp.	7	6½	6⅝
Certain-Teed Products Corp., pf.	28	26½	28
Champion Paper & Fibre Co.	19	19	19
Champion Paper & Fibre Co., pf.	99	99	99
Congoleum-Nairn Co.	25¾	24	24⅛
Container Corp. of America	10⅞	10	10½
Continental-Diamond Fibre Co.	6⅝	6	6⅛
Crown-Zellerbach Co.	10½	9½	10⅜
Crown-Zellerbach Co., pf.	81½	80	80¾
Flintkote Co.	20⅛	19	19
Robert Gair	2⅜	2⅛	2⅛
Robert Gair, pf.	8	7½	8
International Paper & Power	9¼	8⅜	8⅜
International Paper & Power, pf.	34¾	31½	32⅛
Johns-Manville Corp.	71	68	68
Johns-Manville Corp., pf.	127½	127½	127½
Kimberly Clark Corp.	28	27	28
MacAndrews & Forbes	34	33½	34
Masonite Corp.	42	41	41½
Mead Corp.	7½	7⅛	7⅜
Mead Corp., pf.	56	56	56
Paraffine Companies, Inc.	42	42	42
Ruberoid Co.	20	18¼	20
Scott Paper Co.	52	51½	51½
Union Bag & Paper Corp.	7½	7	7⅛
United Paperboard Co.	4⅜	4¼	4⅜
U. S. Gypsum Co.	86½	81½	81½
U. S. Gypsum Co., pf.	175¾	175½	175½

New York Curb Exchange

High, Low and Last for the Week Ending August 16, 1939

	High	Low	Last
American Box Board Co.	6⅛	6	6
Brown Co., pf.	10¼	10¼	10¼
Great Northern Paper	39	38	39
St. Regis Paper Co.	3	2	3
Taggart Corp.	3¼	3¼	3¼

Modern Containers To Offer Stock

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 14, 1939—A public offering of the preferred and common shares of Modern Containers, Limited, is being made. While Modern Containers is a new company the offering of 3,000 shares of 5½% cumulative preference stock and 25,000 shares of no par value common stock does not represent new financing. The shares being offered were acquired through purchase of all the issued and outstanding stock of Collapsible Tubes and Containers, Limited, Toronto, and Modern Machine Company, Limited, Ottawa, which companies have been amalgamated under the name of Modern Containers. The merger of the two units to form Modern Containers was initiated by a Toronto investment firm which has interested a Montreal financial house in making the public offering of the total offering. Only a portion is being offered for subscription to the public. Shareholders of the amalgamated companies were given first chance to subscribe for stock in the new company. Since 1929, the amalgamated companies have been operating under the control of Industrial Securities, Limited, a holding company. For many years they have been manufacturing collapsible tube containers for various preparations. They also manufacture metal and plastic caps for the same as well as bottle tops and stoppers. The yearly average net profit of the combined companies for the past five years has been $44,818. This is equivalent to $14.94 a share on the preference stock and $1.13 on the common stock of Modern Containers. The preference stock is being offered at par and the common stock at $12.50 a share.

Abitibi Bondholders Defer Action

TORONTO, Ont., August 14, 1939—It is understood that further action on the part of the Symington Committee toward a judicial sale of the property of the Abitibi Power and Paper Company, Limited, Toronto, for the benefit of the bondholders awaits the re-opening of the Ontario courts next month. At present the Committee has on deposit over thirty millions of dollars of the total bond issue of forty eight millions of dollars. A number of holders have signified their intention of lining up with the Committee and will deposit their bonds later on.

The newsprint mill of the Abitibi Power and Paper Company, Limited, at Iroquois Falls, Ont., broke an all time record on August 10 when the seven machines produced 672.04 tons of paper for twenty four hours. The previous record run occurred on December 23, 1937, when 653.32 tons were manufactured. The new record was established during a special run on an order for Ireland. New machine records were made on No. 2, No. 3, and No. 6 machines.

Moore Corp. Nets $2.70 Per Share

TORONTO, Ont., August 14, 1939—Business and profits of the Moore Corporation for the first six months of the present year are well in advance of the corresponding period of 1938. Last year Moore Corporation reported total shipments 8.3 per cent below 1937 level. Net profits were equal to $2.70 a share on the common after preferred dividends, as compared with $3.33 a share for 1937. This is after allowing for the merger with the F. N. Burt Company completed at the end of 1938. The directors met recently on the 80th birthday of S. J. Moore, Toronto, founder of the company and its chairman, to declare regular quarterly dividends on the preferred and common shares.

National Container Earns $87,946

National Container Corporation and affiliates for six months to June 30 report a net profit of $87,946, equivalent to 26 cents each on 330,482 shares of common stock, compared with a net profit of $54,299, or 16 cents a share, in the six months to June 30, 1938. Net sales, for the first six months of this year totaled $2,846,584, compared with net sales of $1,990,126 for the same period last year.

Stevens & Thompson Nets $22,889

The Stevens & Thompson Paper Company report for Dec. 10, 1938 to June 24, 1939 a net profit of $22,889.

Chemistry and Patents*

By Ralph H. McKee[1]

In the United States the rate of issuance of patents has been ascending, but the rate of increase of patents issued in the chemical field has for years far exceeded the rate of increase in the general field of patents. In other words, industry is increasingly chemically minded. Indeed, chemistry of late years has been rightly called, using a term borrowed from the army, the Intelligence Department of Industry.

Without patents there is little incentive to invent for remuneration is still more speculative than with patents available. With patent protection, one can invest money and time working out details and improvements most of which are not patentable. It is like building a house on land whose title is securely yours. Without patenting it is like building on land whose ownership is unknown. With compulsory licensing, such as some European countries have, it is like building your house on land purchased from a set of heirs but only part of these heirs have signed the deed.

With a requirement to work the patent within a given period, say two years, it is like building your house with all your money and, in addition, considerable borrowed money and having the lender insist on payment at the due date of two years. Maybe you can sell the house, at a profit but probably the purchaser, knowing your predicament, will offer you but little more than the amount of your borrowed money, and you will take a loss.

A manufacturing company will not consider an outside invention unless a patent has been applied for, or the patent has been issued. Indeed, what has a man with an unpatented process to sell—nothing.

What has a man to sell if he has a patent which can be licensed under a compulsory license? He has only part of a patent to sell or license for another license may be forced under the patent.

If one considers the chemical field of industry one finds that there are certain industries in which Europe has dominated. I refer to developments such as Bessemer steel, the nickel industry, the manufacture of sulphuric acid by the contact process, and high pressure synthetic ammonia processes. These are processes in which the original patents were taken out by Europeans and the momentum acquired by the industries operating under these patents carried them though a number of decades of industrial history.

In this country in the chemical field we have had a number of industries develop and we have become the leading country of the world in these industries. In practically every case these industries had as their start the work of some man whose work eventuated into a patent. Our large rubber industry owes its basis to Goodyear's patent No. 1085 on vulcanization. The plastics industry, in which this country is so prominent, owes its origin to the Baekeland patents, the first of which issued in 1907. The products from the chemical treatment of corn are based on the Behr patent of 1878, no. 250,333. The glass industry has, as its basic patent, the Owens patent no. 766,768 of which the 89th claim is the broadest. Electro-chemistry, electrical precipitation, and photographic products have achieved their importance in America because of early patents. The petroleum industry dates its chemical development in this country from the cracking process of Burton. The paper industry has, as its basis primarily, the patent of B. C. Tilghman of Philadelphia, a patent that issued in 1867 for making sulphite pulp.

Sulphite Process

In general with a chemical invention the history first starts with the idea, a series of laboratory experiments, then an application for patent which later issues as a patent. Then a pilot plant which, if successful technically, is followed by a small industrial plant. Then several small industrial plants, later still a few large plants, and we have the beginnings therein of a large chemical industry.

Tilghman's Patent

Tilghman's patent covered the essentials of the present method of sulphite paper pulp manufacture. He used a lead lined iron digester and required from 7 to 14 hours heating of the wood chips with the acid sulphite cooking liquor. The digester, he used, was a stationary one and not a rotating one. The process, though successful technically, was not successful commercially because the lead lining of the digesters expanded on heating at a different rate from the steel which supported it. Moreover, on cooling it did not return to its original size. His process was subject to the handicap which many other processes have had to meet, i.e., the lack of knowledge of proper equipment in which to carry out the process.

Mitscherlich Patent

Mitscherlich, about 1877, patented his process, a modification of Tilghman's, and it was brought to this country about the same year. He used a brick lining instead of a lead lining for the steel digester. The heating was done with lead coils, carrying steam and later copper coils carrying steam. The steam used was at a low pressure of 30 to 35 pounds per square inch because that was all the lead pipe would stand. The time required for cooking the wood was 35 to 60 hours. The digesters were, at first, rotating digesters about 10 feet in diameter and 36 feet long. Later, stationary digesters of about this size were made and stood on end.

Digester Construction

Bronze

The advantages of the Tilghman process with its higher steam pressure and temperature reaching 150 deg. C. and thereby needing only the short time of 7 to 14 hours intrigued the industry and attempts were made to get better equipment for handling such a process. Some bronze digesters were used but when one blew up at Orono, Maine, it stopped the use of the bronze digesters.

Steel, Brick and Cement

The next step was to use a steel digester but the space between the brick and the steel shell was filled

* An abridgment of a talk delivered May 3, 1939, at a meeting of the Federal Bar Association of New York.

[1] Member TAPPI, Professor of Chemical Engineering, Columbia University, New York, N. Y.

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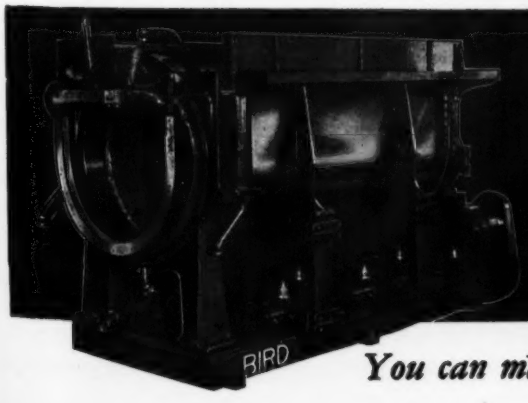

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with a layer of Portland cement. This was used for several decades and is still in use. Later there have been some digesters built with a carbon block lining instead of a clay brick lining. Now, we see coming into use the stainless steel unlined digester. It should be stated that Wheelwright, about 1885, reduced repair costs from about $10 to $1.50 per ton of pulp made by changing the form of the digester.

PATENT LICENSES

Through all of this development it is to be noted that the several inventors kept improving and cheapening the process, partly by increasing the size of the unit from a digester holding 2 cords of wood to the present digester holding 30 cords of wood. However, through this period not a digester was built which was not under the license of one or more patents. Each new constructor wished to make a more up to date piece of equipment and carry out the process better and more cheaply than any of his predecessors. This has been accomplished and the bond paper on which you wrote letters today and which has as its basis sulphite pulp is a better paper than the rag paper used by your fathers. The cheapening of paper has meant a continual increase through the years in paper production. This increase of tonnage has run between 3 and 5 per cent a year except for the years of 1921 and about 1933.

Increased Wages and Employment

It is to be noted further that there has likewise been a continual increase in the aggregate of labor required. It is true that machinery has saved labor and that the large units require no more man-hours to operate than did the smaller units but it must be remembered that alongside of this there has been an increased requirement in hours of labor because of the desire for improved quality. There has been an increase in hours of labor because the wood is cut further from the mill. With this has gone an increased requirement of hours of labor in transportation. Furthermore, with the increased requirements for number of hours of labor has, also, gone increased wages per hour due to the higher skill required of workmen. The rate per hour of secondary employment such as that of truck drivers hauling pulpwood is higher than that of the railroad brakeman of railroad years or of river logdrivers. Of late, we have had the depreciated currency which still more increases the rate per hour drawn by the workman. In other words, more men and a higher rate of pay per ton of pulp has been the order from year to year! Who says inventions reduce labor requirements. Inventions increase not decrease labor needs —and for 70 years after the invention.

With all of this the public is getting paper cheaper than ever before. The primary reason for this fact is that the paper industry has been one which nurtured inventions and in which there has been no hesitancy to take a license under a new invention. The industry is, however, peculiar in one respect and that is that in general it pays a lump sum for a license instead of paying a royalty per pound of product made. If there had been no patents or if our patent system had been similar to that of European countries the paper industry would be in the same poor position as that of European countries which have a comparable supply of raw material, for example, France or the old Austria-Hungary.

Unpatented Processes

Unpatented processes are, in general, not wanted in industry. A good chemical illustration of this was the process of making phthalic anhydride from naphthalene devised by Gibbs and patented by him as patent no. 1,285,117. This patent was one taken out by an employee of the Department of Agriculture, as such, was dedicated to the public, so that anyone was free to use it without payment of royalty. The process was not only published in the form of a patent but, also, promoted and publicized by the Department of Agriculture and yet no industrial firms took up the process until the Gibbs English patent was sold to a British firm for, I understand, £5000. It was only when the process was further improved by other American inventors and the improvement covered by patents that American firms, taking licenses under the improvement patents, went into the business of making phthalic anhydride.

Industrial firms in general are not interested in taking up new unpatented processes. One of the first questions they ask regarding a new process is if it is patented and if it is not they are not, and properly not, interested.

Colloidal Phenomena

A new text book under the title of "Colloidal Phenomena" by Ernst A. Hauser, Ph.D., associate professor of chemical engineering at the Massachusetts Institute of Technology, has just been published by the McGraw-Hill Book Company, New York, at $3 a copy.

In his preface, Dr. Hauser states that "the study of colloidal phenomena has been and still is largely an experimental science. The great number of variables influencing the properties of colloidal systems, makes it extremely difficult to formulate theories of a general nature."

The 272-pages of text are based on notes by the author which he has used as text for classes in colloid chemistry and physics at the Massachusetts Institute of Technology. "These courses," Dr. Hauser informs us, "have proved that the average student comprehends a logical presentation of such a subject more readily than a mathematical treatment. Once the principles have been mastered, the student can easily follow the mathematics."

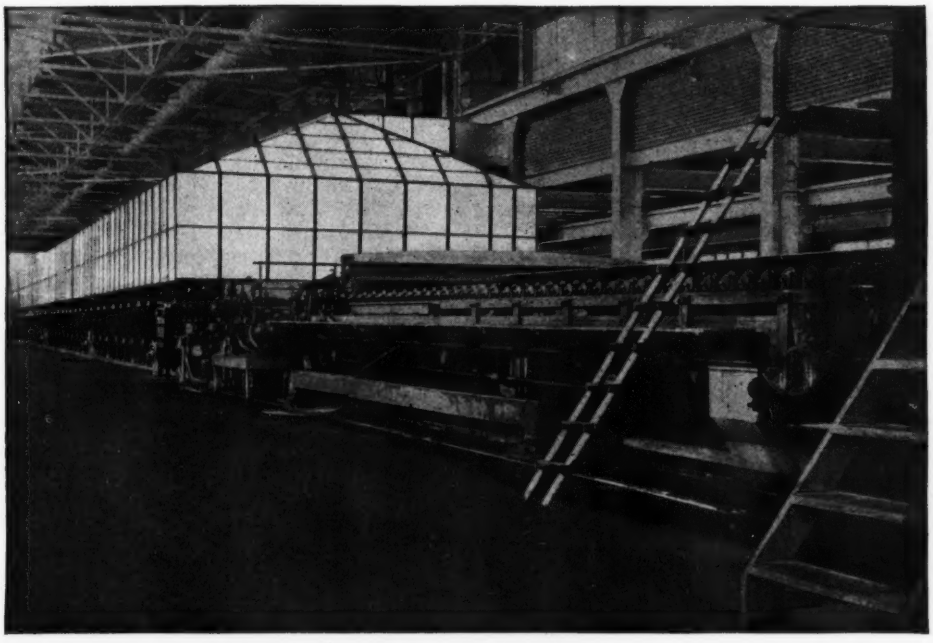
In explaining the selection of his title, Dr. Hauser points out that "the customary term 'colloid chemistry' has long outlived its justification. In German literature the term *Kolloidik* has been introduced recently as a means of expressing in one word the chemistry and physics of colloids. Since the colloidal state of matter is mainly characterized by specific phenomena and since this book is primarily concerned with their discussion and interpretation the title as chosen seems most descriptive of the purpose to which this book is dedicated."

Boston Reports Improvement

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 14, 1939—Some merchants of fine and kraft papers and twine report somewhat better business. At least a portion of those handling specialties are more active than they were. Dealers are receiving a larger number of orders in greater volume.

ANOTHER BELOIT MACHINE



THIS FINE PAPER MACHINE IS THE PRODUCT OF THE MODERN ENGINEERING AND MANUFACTURING FACILITIES WHICH MAKE BELOIT THE LEADER IN MEETING THE EXACTING DEMANDS OF THE PAPER INDUSTRY

THE BELOIT WAY BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS. U.S.A. **IS THE MODERN WAY**

Deny Injury From Imported Pulp

Referring to the statement of the Treasury Department that the result of their preliminary investigation indicates injury to the domestic wood pulp industry by reason of the importation of foreign wood pulp at low prices, C. B. Overton, president of the Association of American Wood Pulp Importers said:

"The United States wood pulp market has not been injured by sales of foreign pulp. The decline in pulp prices since July 1937 was due to heavy over-buying in 1936 and early 1937 followed by the severe general recession of late 1937 which left large stocks on hand with no demand in 1938; to the Sino-Japanese war which threw back on the United States market huge stocks contracted for by Japan, and to sudden overproduction in the South of sulphates which came on the market at that time.

To lay the ills of the United States Pulp Producers at the door of foreign competition is evidence of a desire to blame others for results which have been largely brought about by the complainants themselves and is distinctly unfair to the importing industry which has for decades faithfuly served U. S. paper makers who are largely dependent on foreign pulp, of which they use and need approximately $100,000,000 worth per annum.

Doubtless isolated individuals among domestic producers and importers alike have at times made unwise sales, but the alleged injury to the handful of U. S. mills producing pulp exclusively for sale could not by any stretch of the imagination be comparable with the definite and possibly ruinous damage to over 250 American paper mills should dumping duties be assessed against foreign pulp."

Mr. Overton pointed out that should a finding of dumping be issued the duties would be retroactive, applying to all of the shipments which have not been passed by Customs since April 1st, and which would thereupon be reexamined and subject to duties of possibly as much as Thirty Dollars a ton where technical violation of the law is found, even though pulp had been made into paper and the paper sold and delivered.

Commenting upon the Treasury Department's statement that their preliminary investigation indicates possibility of some injury to the domestic Wood Pulp industry by reason of the importation of foreign Wood Pulp at low prices, R. C. Mateer, chairman of the Wood Pulp Consumers Committee said, "it is my firm conviction that the U. S. Pulp Producers Association made a most unfortunate error of judgment when they went directly to the Treasury Department for this investigation instead of first having submitted the matter for review and investigation by the American Pulp and Paper Association.

"The American Pulp and Paper Association is representative of the entire pulp and paper industry which divides into two broad classifications—self-contained mills which produce pulp for conversion into paper in their own paper mills and the so-called converting mills which purchase pulp for conversion into paper in their paper mills.

"It is not at all beyond the bounds of probability that the American Pulp and Paper Association could have brought the conflicting interests of the pulp producing paper mills and the non-pulp producing paper mills into harmonious relationship whereas the present Treasury investigation makes a distinct line of demarcation between the two major divisions comprising the great American pulp and paper industry which might possibly result in the formation of two hostile rather than two cooperative groups.

"It is a well known fact that in the paper industry there are only a few pulp manufacturers producing pulp for sale to paper manufacturers. By far the larger tonnage of pulp produced in the U. S. A., is produced by mills which are both pulp manufacturers and paper manufacturers and which, therefore, compete in the paper manufacturing branch of their business with the pulp buying paper mills. Furthermore, a large annual tonnage of pulp is needed in the United States for special purpose paper, such as blotting, tissue, cigarette papers and certain grades of book and writing paper, etc., and the special pulp required for these purposes are not available in the United States in the tonnage required. Converting mills in each category are, therefore, aghast at the implications of the current investigation which might possibly cut them off from their long established foreign supply, for domestic sources of supply, especially of pulps in these categories are entirely inadequate from exclusive pulp producing manufacturers. A split of the paper industry into two hostile factions would be especially unfortunate at this time when the utmost in cooperation is needed for there is great excess in manufacturing capacity in many branches of the paper industry.

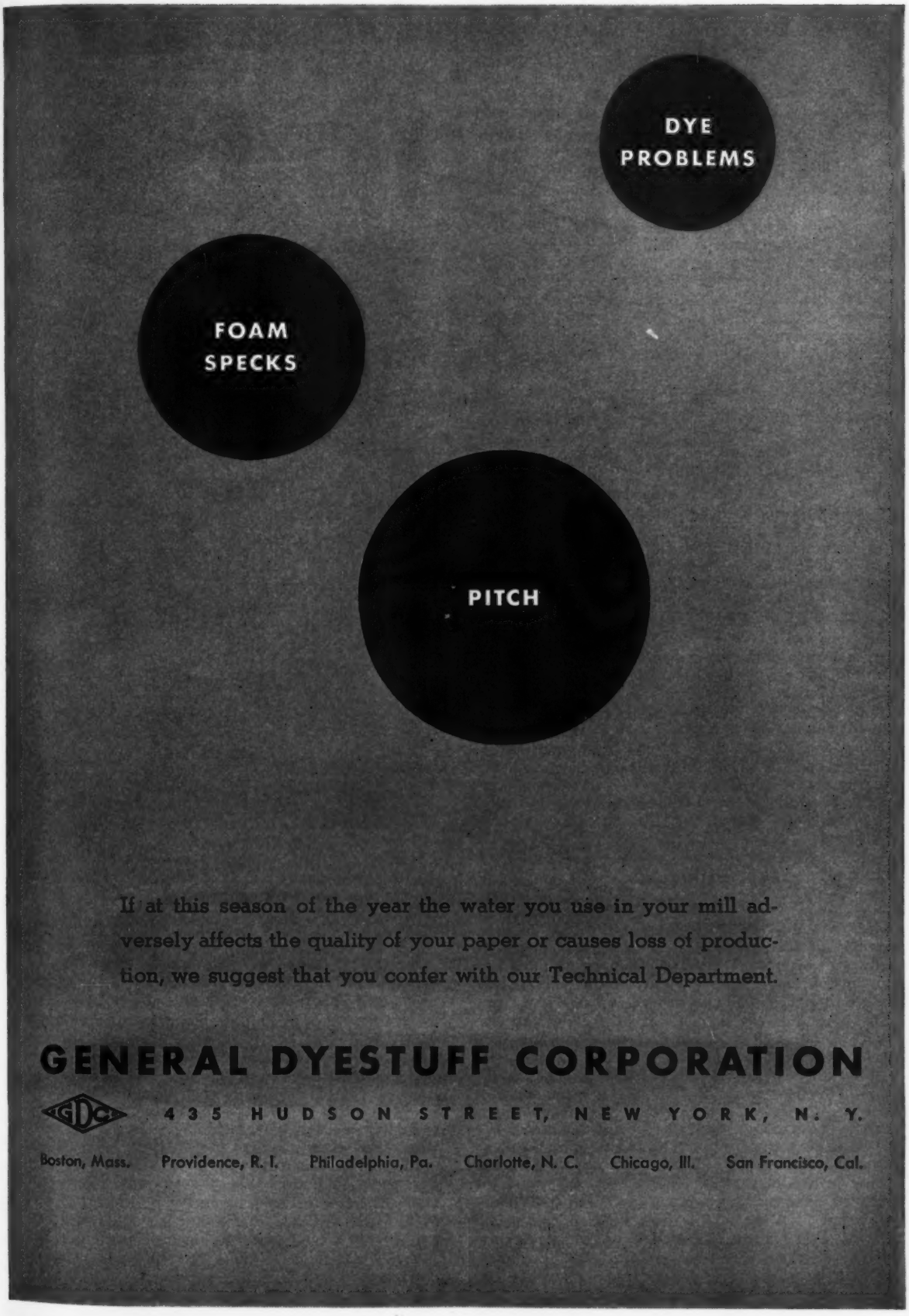
"I am still hopeful that The American Paper and Pulp Association will accept the responsibility of at least trying to adjudicate what is now definite conflict of interest. This is far more to be desired than a severance of all relations between the self-contained and the converting mills which would jeopardize the very existence of the American Paper and Pulp Association itself, substituting, therefore, two non-cooperative groups, the U. S. Pulp Producers Association and the Wood Pulp Consumers Committee."

Pliofilm Stretch-Wrap Machine

Development of a stretch-wrap machine for packaging of various articles of miscellaneous shapes in Pliofilm, is announced by the Goodyear Tire and Rubber Company, Akron, Ohio. Known as the Pfeiffer Pliofilm Stretch Wrap machine, the new equipment was developed by Fred Pfeiffer, of Akron, in conjunction with Goodyear technical men and will be manufactured by The Stokes & Smith Company, of Philadelphia.

The stretch-wrap machine takes advantage of the following Pliofilm characteristics; stretchability when heated; strength increase in all directions when so stretched; extreme resistance to puncture when stretched, making application to irregular shapes easy; Pliofilm self-seals when heated—thus with the new machine any article can be wrapped and sealed in one operation.

This machine thus enables a quick, easy, inexpensive wrapping process with Pliofilm, that assures transparent protection to the wrapped object against all the things to which Pliofilm is impervious, including air.



If at this season of the year the water you use in your mill adversely affects the quality of your paper or causes loss of production, we suggest that you confer with our Technical Department.

GENERAL DYESTUFF CORPORATION

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Obituary

Fred W. Sutherland

Fred W. Sutherland, executive vice president and secretary of the Sutherland Paper Company, Kalamazoo, Mich., died August 10 at his home in that city at the age of 51.

Mr. Sutherland, a lifelong resident here, began his career as a newsboy and entered the paper making industry in 1907 when he was made assistant in the purchasing department of the Bryant Paper Company. Ten years later, with his brother, Louis, and the late Oscar Gumbinsky, he organized the Kalamazoo Sanitary Carton Company, which subsequently became the Sutherland Paper Company which now employs 1,700 persons.

Also surviving are his widow, two daughters, Mrs. William Adams Kirkpatrick 2d and Judith Ann; his mother, Mrs. Anna Sutherland, and a sister, Mrs. O. F. Miller, all of Kalamazoo.

Maurice La Belle

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 14, 1939—Maurice La Belle, of Ottawa, first vice president of the International Union of Pulp and Sulphite Workers, a well known resident of the capital city for many years, died of a heart attack when about to address a meeting of the union on August 4th. He was born in Pembroke, Ont., and moved to Ottawa about thirty years ago, after working in the pulp and paper mills at Sturgeon Falls, Ont. For twenty five years he had been an official and organizer of the union, the last ten of which he had held the post of first vice president. The headquarters of the organization is in Fort Edward, N. Y. Surviving are his widow, three sons and two daughters. At the funeral John P. Burke, of Fort Edward, president, and A. Corneau, of Hull, Que., were the official delegates of the International Brotherhood of Pulp, Sulphite, and Paper Mill Workers while the local union from the district were well represented. Floral tributes were received from many mills and local unions. Interment took place in Ottawa.

Economy of Northern Countries

A second edition of "The Northern countries in world economy" has just been published by the delegations for the promotion of economic cooperation between the northern countries, comprising Denmark, Finland, Iceland, Norway, and Sweden. The book, issued by the Consulate General of Norway, New York, describes the economic structure and cooperation of the northern countries, their products and purchases abroad.

Of particular interest to the paper industry is the chapter on forestry and allied industries, in which it is stated that woodpulp exported from the northern countries amounts to 85 per cent and cellulose to 71 per cent of the world's total exports of these products; that the exports of newsprint occupy the leading place on the international market from the point of view of quantity, those exports amounting to about 40 per cent. Exports of other kinds of paper are approximately 50 per cent of the world's total exports, thus the northern countries account for almost half of the world's free paper trade.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 16, 1939—Barton, Duer & Koch Company has been awarded the contract for furnishing the Government Printing Office with 40,000 pounds of yellow sulphite writing paper in 32-inch rolls at 4.52 cents. R. P. Andrews Paper Company will furnish 1,050 sheets of 21 x 32 pink gummed paper at $18 per M sheets. Bids for both of these items were received on July 19.

R. P. Andrews Paper Company will furnish 6,000 sheets of Whiting's woven linen azure note paper at $25.60 per M sheets, bids for which were received on July 17.

Graham Paper Company will furnish 5,550 pounds of 36 x 48 inch 185 pounds, 50 per cent rag, lithograph finish paper at 9.37 cents; also 25,900 pounds same 259 pounds at 9.37 cents; R. P. Andrews Paper Company will furnish 69,000 pounds 32 x 48 inch same, 230 pounds at 9.37 cents. Bids for all of these items were received on July 12. S. D. Warren Company will furnish 67,600 pounds 28 x 41 inch dull coated book paper at 5.84 cents.

The Printing Office received the following bids for 37,474 pounds (251,500 sheets) of 29 x 48 white sulphite writing paper; Perkins Goodwin Company, 4.43 cents; Butler Company, 5.52 cents; Cauthorne Paper Company, 5.5 cents; Whitaker Paper Company, 4.425 cents; Stanford Paper Company, 5.25 cents; R. P. Andrews Paper Company, 5.46 cents; Barton, Duer & Koch Paper Company, 4.43 cents; Aetna Paper Company, 5.48 cents; Old Dominion Paper Company, 4.4298 cents; Mudge Paper Company, 5.09 cents; and Mathers-Lamm Paper Company, 5.08 cents.

For 1,000 sheets of 25 x 38 paraffine manila paper; Mathers-Lamm Paper Company, 12.5 cents; and R. P. Andrews Paper Company, 10.5 cents.

For 1,584 pounds of 28 x 34 yellow sulphite writing paper; Stanford Paper Company, 9.95 cents.

Forest Resources of N. Georgia

Forest Survey Release No. 45, "Forest Resources of North Georgia", by A. R. Spillers, of the Southern Forest Survey staff has just been issued. North Georgia, the region covered by this report, has a total area of 4¼ million acres, of which 2¾ million acres, or two-thirds of the total are forest. It is a mountainous area with many steep slopes and much soil erosion, especially on cleared land. Although this region includes the Chattahoochee National Forest of about 600,000 acres, most of the forest land is privately owned, largely by farmers.

The supply of timber in North Georgia is sufficient to justify and maintain continuously a considerably increased forest industry. A pulp mill could find here adequate wood supplies without undue competition with other industries, provided it took a large part of its wood from low-grade hardwoods and pines. If the forest resource is fully developed and utilized, the opportunity for employment of idle people and idle acres will be increased greatly.

More and better forest fire protection, a better understanding and more general practice of good forest management, and the establishment of greater and more diversified local manufacturing outlets for forest products are the outstanding needs to make this timber wealth play its full part in the social and economic development of the region.

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Leather manufacturers use TITANOX pigmented finishes in the processing of white leather because they promote the maximum obtainable of opacity, whiteness, brightness and flexibility. Experience has taught that leather, once whitened with TITANOX pigments, remains white without after-yellowing. To cover and hide skins that are especially hard to finish is no problem when TITANOX pigments are used.

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Use TITANOX pigments with confidence, in all grades of paper stocks. Our Service Department will gladly advise regarding their application.

What's in a name?

TITANOX represents the products of the original makers of titanium pigments who have pioneered fundamental improvements which have brought these pigments from unknown materials to essential commodities in the paper industry. In their present form TITANOX pigments exhibit the ultimate of scientific skill and manufacturing technique in the development of titanium up to this time. Therefore TITANOX means not only excellent pigments, but also a notable record of accomplishment in making them faithful to your needs.

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Tested Papers of America Organize

The announcement made August 2 at Columbus, Ohio, of the organization of Tested Papers of America, Inc., to market household and supply papers under a national promotion program.

R. W. Miller, vice president of The Central Ohio Paper Company of Columbus, Ohio, who conceived the idea of "Tested Papers," was elected chairman of the board of directors of the new corporation. Frank P. Vaughan was elected president and general manager, resigning as general manager of the Bay West Paper Company of Green Bay, Wis. E. P. Magel of the Crescent Paper Company of Indianapolis was elected treasurer and John Wesley, formerly vice president and salesmanager of the Rhinelander Paper Company was elected secretary.

"Tested Papers of America, Inc.," already represented in more than 70 per cent of the United States, plans to market tested-quality, trade-marked brands of household and supply papers, to include bathroom tissue, kitchen towels, wax paper, facial tisue and numerous related household items, also a complete supply line for commercial use.

The reason for organizing the independent paper merchants of America was contained in a statement issued by Mr. Vaughan. "In order to improve the situation in our industry which is suffering from uncontrolled, profitless merchandising abuses, it was necessary to create a constructive merchandising force within our own ranks, establish fair dealer policies, and ethically market our own brands of quality papers under the Fair Trade Practices Act.

"Up to the moment, 'Tested Papers' has franchised more than 125 distributing points, each of which is an important factor in the household paper field.

"It should not be assumed that we are a cooperative buying corporation. On the contrary, the chief function of 'Tested Papers' is good merchandising: supplying to the consuming public an entirely new line of quality household papers at the lowest prices, and making it possible for the manufacturer, distributor and retailer to make a profit.

" 'Tested papers' is being financed from the proceeds of stock and franchise sales and from licensing of mills. All funds accumulated are to be disbursed solely for broadening distribution and advertising 'Tested Papers' brands, and for the development of new products.

"Steps are being taken to establish a testing laboratory in Chicago where a running check on every product will be made to certify quality, and where research on new products will be scientifically conducted. Control both of product-quality and merchandising is the nugget of our plan."

Mr. Vaughan has appointed Ruthrauff & Ryan, Inc., merchandising and advertising counsel, who number among their accounts such notable names as Lifebuoy, Rinso, Noxzema, Goodrich Tires, Dodge Cars and Trucks, American Airlines, etc.

The directors elected are as follows:

R. C. Kettles, Jr., New York; R. W. Miller, Columbus, Ohio; E. P. Magel, Indianapolis, Indiana; L. S. Altholz, Chicago, Ill.; Morris Balter, Pittsburgh, Pa.; J. C. Campbell, Jr., Pawtucket, R. I.; Sydney L. Wellhouse, Atlanta, Ga.; Stark S. Dillard, Greensboro, N. C.; H. T. Newell, Jackson, Miss.; George Giddey, Detroit, Mich.; L. S. Pollock, Dallas, Tex.; R. A. Hartinger, St. Paul, Minn.; R. J. Pratt, Des Moines, Ia.; F. W. Howe, Buffalo, N. Y.; John S. Addison, Racine, Wisc.

General headquarters of "Tested Papers of America, Inc.," will be located in Chicago.

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pH Value of Papers

The acidity of a paper, expressed as its pH value, is now considered one of the most important items on which to base an estimate of its lasting qualities. A relatively acidic paper will deteriorate despite any other properties it may have. The Government, in buying record paper, accordingly requires that the pH value must meet a certain specification. It is, therefore, very important that a method of measuring the pH be available which will give values as reproducible as possible. Unfortunately, the methods in use at the present time have been found to give results which sometimes differ widely.

An improved method which is rapid and has good reproducibility, has been developed by Herbert F. Launer at the National Bureau of Standards. It requires far less handling of the papers than previous methods, thus decreasing the probability of obtaining misleading results through contamination. Extraction is made at room temperature, since no advantage of using hot water, as prescribed by the method generally used, could be found. Reports on the method, given in the Bureau RP1205 show that the pH values obtained by the new procedure are in good correlation with the chemical stability and with the percentages of alum used in the manufacture of the papers, and may, therefore, be said to represent the quality of the papers adequately. In studying these relationships, many varieties of experimental papers were used, which had been produced under carefully controlled conditions in the Bureau's semicommercial paper mill.

Copies of this Research Paper can be obtained from the Superintendents of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

Lead in 1937 Woodpulp Production

A study by the Forest Products Division of Census Bureau data revealed today that Northeastern and Central states led in the production of woodpulp in 1937. The North Pacific States ranked second in production and Southern states were third. In fourth place was the Lake states area.

Value of woodpulp produced in the Northeastern and Central States in the year under review was $75,696,125; that of the North Pacific States $56,797,430; Southern States' production was valued at $49,808,699, and that of the Lake States area was $43,270,509.

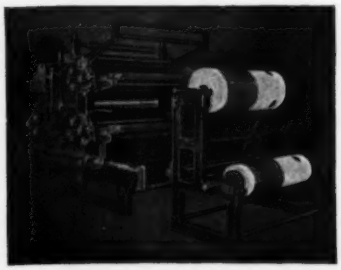
By individual States, Washington ranked first with a total woodpulp production valued at $48,233,205. Maine was second at $28,802,579, fractionally above the production of Wisconsin which was valued at $28,024,845.

Southern states consumed 3,029,233 cords of wood in producing its 1937 pulp; Northeastern and Central States used 2,859,289 cords, and the North Pacific states consumed 2,681,136 cords.

This combined consumption, amounting to 10,393,800 cords of pulpwood, valued at $82,884,799, produced 6,572,819 tons of pulp valued at $225,573,125.

New Arc Type Web Press

A new Arc Type Web Press that will print from one to six colors with rotary register while the press is running is announced by Paper Converting Machine Company, Green Bay, Wis. The speed of this press depends on the size of the cylinder, kind of ink used, type of printing, and the paper stock, with a range of speed from 300 feet to 800 feet per minute, and designed to use rubber plates, rubber with metal backing, or metal plates. Illustrated here is the press arranged to use rubber plates with elastotype back to affix the plates of the printing cylinder. This press will take from 15 to 24 inch circumference in one series and from 24 to 40 inch circumference cylinders in the second series, the printing cylinders being set in the main frame with the tympan.



One of the features of this press is that no oil or grease can drop on the web while entering or leaving the press, as the web is carried in position out of the way. Ink distribution in separate frames that can be racked back from the printing cylinders provide easy access to the press, which makes possible quick change of plate cylinders. The standard distributing system includes 3 form rolls, 3 vibrators, 2 transfer rolls and a large standard type ink fountain. This press is made heavy so as to reduce vibration—3¼ inch frames well ribbed and reinforced, so that the press can be operated successfully at high speeds with perfect rotary register.

Northwest Div. To Meet at Wausau

The Northwest Division American Pulp and Paper Superintendents Association will convene at Wausau, Wis., September 8 and 9. The following papers will be presented at the general meetings: "New Advances in Mining—Storing and Transportation of Coal," "Discussion on Various Types of Paper Mill Insurance," "The Use of Vortraps in Paper and Pulp mills," and "The Howard Sulphite Waste Liquor Recovery Process."

The Divisional Officers are Chairman—E. W. Peterson, Mosinee Paper Mills Company; 1st Vice Chairman—Lewis Dozier, Rhinelander Paper Company; 2nd Vice Chairman—R. J. LeRoux, Consolidated Water Power and Paper Company; Secretary-Treasurer—George H. Urban, Marathon Paper Mills Company.

The Convention Committee consists of General Chairman—Harold A. Skinner, Marathon Paper Mills Company and Secretary-Treasurer—George H. Urban, Marathon Paper Mills Company.

The Advisory Committee is E. W. Peterson, Mosinee Paper Mills Company; William B. Clements, Wausau Paper Mills Company; R. H. Kelly, Marathon Paper Mills Company; Grover Keeth, Marathon Paper Mills Company; Mark M. Whitman, Marathon Paper Mills Company.

CINCINNATI ROLL COVERS have a reputation for holding the CROWN

THE CINCINNATI RUBBER MANUFACTURING CO.
CINCINNATI, OHIO

Bird & Son Hold Weekly Forums

An economist who admits he can learn and "can take it" from office and factory workers is Dr. James M. Matthews, economics director at Babson Institute, Wellesley, Mass., who for the past two years has been conducting weekly economic forums at the East Walpole, Mass., plant of Bird & Son, Inc., manufacturers of roofing, flooring and paper products.

Dr. Matthews finds these contacts with Bird & Son employees highly stimulating and enlightening. Although he is officially the leader of the group discussion, the instruction is by no means one-sided, he confesses.

"As an analyst of past and present economic problems, in their relation to future business policy, I run the danger at times of getting my economic feet somewhat off the ground of practical reality," Dr. Matthews said. "Nothing is so effective in bringing me back, and in stabilizing my thinking, as these discussions with this active-minded group of practical men and women."

The conferences are part of a series of educational meetings sponsored for a number of years by the educational committee of The Bird Club, an employees' organization with more than 900 members. Attendance is voluntary, meetings are held outside office hours, and employees pay for most of the expense of the course out of their own pockets. Yet even during the worst winter weather the attendance has averaged over 95 per cent.

Senior and junior executives, clerical employees and plant workers all participate freely in discussion and the interchange of opinion. Among the questions discussed at this year's sessions were why business firms fail, reduction of seasonal unemployment, dangers of business senility, new economics of selling, the prolonged depression, how industry can increase the national income, and the relation of low price policy to economic recovery.

"The truth is sure to come out somewhere in these forum discussions, or at least come a little nearer the surface for eventual discovery," Dr. Matthews said. "Sometimes 'I get it' right in the intellectual solar plexus from this good natured but practical audience, and sometimes they 'take it from me.'"

Dr. Matthews points out that although forum meetings like these at Bird & Son are not new in industry, they were probably never more important than today when conditions are changing so rapidly and when new problems must be faced so constantly. "There are no serious dangers ahead for American institutions, social, economic and political, so long as the American people continue to think," he said. "Such discussions as these at Bird & Son are a long step in the right direction of learning to think clearly and correctly."

Ernest H. Coleman, head of the cost accounting department at Bird & Son, is chairman of the educational committee sponsoring the forum series. Others on this committee, which represents a cross section of plant activity, are Hermon T. Barker, chief research chemist of the paper division; Paul A. Guttormsen, chief engineer; Stuart A. Nickerson, foreman at the flooring plant, and James D. Mack, accountant at the roofing plant.

Mr. Coleman, expressing the opinion felt at Bird & Son, believes that there is a distinct advantage in supplementing actual business experience with progressive thinking on industrial and commercial problems. "Bird & Son, Inc., 144 years old, has a wide and long range of plant experience," he said. "If history always repeated itself with accuracy, we doubtless could become a law unto ourselves, based on this accumulation of experience. American industry as a whole, however, and many American plants, individually considered, have recently encountered problems which they never encountered before. Experience, therefore, may not be entirely sufficient for future business problem solution."

New Literature

Bulletin No. 2225, issued by The Permutit Company, 330 West 42nd street, New York, describes the new Deflector Plate Distributor, featured in the Permutit Type "F" filters. It also contains information on the new Expansible Strainer Heads and Group Control of filter units, with specifications.

A leaflet issued by the Noble & Wood Machine Company, Hoosick Falls, N. Y., describes the "E-Z" shell liner for Jordan engines. The company's replacement plug and shell filling for all makes of Jordans, include N W dreadnaught steel, heat-treated super alloy steel, etc., and woods of oak, maple, hickory and massaranduba.

Bulletin 2-210-B24, issued by the Worthington Pump and Machinery Corporation, Harrison, N. J., describes Worthington Deaerating Heaters, designed to heat and furnish water containing more than .03 cc. of dissolved oxygen per liter. The Worthington Deaerators are also described, being of the same vertical double-element type, and designed to heat and furnish water free from dissolved oxygen.

Leaflet SP-1, issued by De Laval Steam Turbine Company, Trenton, N. J., describes submerged suction priming equipment for De Laval centrifugal pumps and the construction, operation and advantages of submerged suction priming system, requiring no manual attention.

Technical Bulletin 11-B, issued by The Babcock & Wilcox Tube Company, Beaver Falls, Pa., contains specifications established for carbon steel and alloy tubes by the American Society for Testing Materials, and The Association of American Railways, and specifications established by The Babcock & Wilcox Tube Company for high chrome and stainless alloy tubes.

Bulletin No. 209, issued by the Chambon Corporation, Garfield, N. J., describes the company's new Champlian rotary, Type 3G Letterpress, equipped with two printing units, and other presses made by the company.

Booklet No. 59, just issued by the American Manganese Steel Division of the American Brake Shoe and Foundry Company, Chicago Heights, Ill., describes Amsco steel. It contains much useful information on the characteristics, production and uses of manganese steel and applications for general industry.

A new bulletin No. 25-A on suspended magnets has been issued by the Stearns Magnetic Manufacturing Company, Milwaukee, Wis., makers of magnetic separators and magnetic power transmission devices. The bulletin is descriptive of the company's line of suspended magnets and contains information concerning various applications. An interesting item is the Stearns hand magnet which has been designed to fill a demand for such a unit to be used in holding small castings for surface grinding operations; also for handling small articles, nuts, bolts, washers and other bin stock where the use of a magnet is more

efficient and economical than using scoops or other means.

Schlafer Supply Company, Appleton, Wis., has issued a small booklet of especial interest to the paper mills, containing information on some of the many paper mill specialties distributed by this firm.

Schlafer's has the unique distinction of being the oldest firm in America specializing in the many small but important items in everyday use in paper mills and the result is that their customers are in every paper making state in the Union as well as in Canada. They are, also, the only firm in the country issuing a catalogue exclusively for the paper maker. Many of the items in their catalog are either made by themselves or made specially for them.

Catalogue No. 739, issued by the Stephens-Adamson Manufacturing Company, Aurora, Ill., describes the Sealmaster ball bearing pillow blocks. The same advanced seal design is built into the new flange and take-up units. Sealmaster bearings are self-aligning bearing units. The seal effectively seals bearings against all foreign material and retains lubricant. Misalignment of shaft cannot interfere with effectiveness of the seal and dirt cannot enter bearing.

Pipe welding is described in a folder issued by the Taylor Forge and Pipe Works, P.O. Box 485, Chicago, Ill. It clearly explains a method for better pipe welding at lower cost by means of the centering Weldell. The feature of this method is the integral ring or lip which centers the Weldell in the pipe to which it is to be welded, eliminating the need for a backing ring, clamps or guides.

Goes cutting knives are described in a folder issued by the Loring Goes Company, Worcester, Mass. The Goes Company specializes in paper cutting knives and Goes "Seoc" new cutting edge on stop cutters, ream cutters, sheeter knives, etc., is standard equipment in many divisions of the paper industry.

Bulletin B6012, just issued by the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., describes the company's latest line of Vertical Lift Metal Clad Switchgear, to provide maximum safety with minimum expense for control of generators, motors, incoming lines, feeders, bus tie circuits, etc. Newest safety features and construction details are included.

Bulletin B6011, is an enlarged and revised issue of the Allis-Chalmers Indoor Cubicle Type Switchgear, giving construction data, wiring diagrams and installation views.

Bulletin B6910, just released by Allis-Chalmers, is a price list and gives dimensions, applications of AC and DC motors and typical electrical and mechanical variations for special purposes.

Publication GEA-137D, issued by the General Electric Company, Schenectady, N. Y., describes the company's low, speed synchronous motors, Type TS, with ratings of 20 h.p. at 257 r.p.m., to 225 h.p. at 450 r.p.m. Publication GEA-1960A, describes Type ATI, low speed synchronous generators, furnished with armortissuer windings, and Type ATB without this winding The amortisseur windings are recommended for use with internal combustion engines, for generators operating single-phase, and for generators having completely automatic control equipment.

Catalogue No. 639, issued by the Stephens-Adams Manufacturing Company, Aurora, Ill., describes the Mosley Mill. This equipment is of the air-swept type for fine grinding and pulverizing dry materials and is adjustable while running to reduce materials to pre-determined sizes from 10 to 325 mesh.

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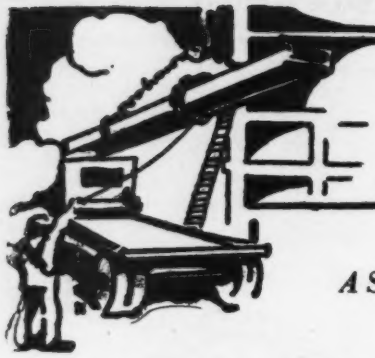

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Kansas City, Mo.—The C. F. Downey Box Company, 14th and Iron streets, manufacturer of corrugated boxes and containers, has plans for new one-story addition, 50 x 196 feet, including new boiler house. Cost reported over $60,000, including equipment. Bids have been asked on general erection contract and work will be placed under way soon. Charles A. Smith, Finance Building, Kansas City, is architect. Charles F. Downey is president.

Erie, Pa.—The Erie Corrugated Paper Box Company, 922 Beacon street, manufacturer of corrugated boxes and containers, is awarding miscellaneous contracts for new addition to plant, recently referred to in these columns, including award to Erie Concrete and Steel Company, Erie, for steel frame superstructure. Award for sprinkler system will be made soon. New unit will be two story and basement, 100 x 200 feet, reported to cost in excess of $60,000, including equipment. Work is being placed under way, with completion scheduled late in the fall. E. E. Austin & Sons, Twentieth and Reed streets, Erie, has the general erection contract.

Muskegon, Mich.—The Central Paper Company, Inc., manufacturer of general paper products, kraft and tissue stocks, etc., has work under way on modernization and improvements in mill, including extensions in power house. A new turbine unit and auxiliary equipment is being installed. Entire project is estimated to cost close to $60,000.

New York, N. Y.—The Chic Container Corporation, recently organized with capital of 200 shares of stock, no par value, plans operation of local plant for the manufacture of paper boxes and containers. New company is represented by Morris Abrams, 551 Fifth avenue, New York, attorney.

Kansas City, Mo.—The Superior Wall Paper Company, Joliet, Ill., manufacturer of wall paper stocks, has leased a new industrial building to be erected by the Kansas City Development Company, Railway Exchange Building, Kansas City, at Sixteenth and Howell streets, North Kansas City, to be one-story, 66 x 250 feet, and will equip and occupy for new branch mill, including storage and distributing facilities. Erection contract has been awarded to the Morris Hoffman Construction Company, Victor Building, Kansas City, Mo., and work will be placed under way at once. New plant is reported to cost over $75,000, with equipment. It is scheduled to be ready for occupancy late in the fall. Frohwerk & Bloomgarten, Bonfils Building, Kansas City, are architects.

Menasha, Wis.—The Marathon Paper Mills Company, Rothschild, Wis., manufacturer of waxed and other processed papers, box board products, etc., has awarded general contract to the Worden-Allen Company, West Capitol drive and North Third street, Milwaukee, Wis., for erection of proposed addition to branch mill on River street, Menasha, previously referred to in these columns. It will be two-story and basement, 110 x 220 feet, reported to cost close to $80,000, with equipment. Work will be placed under way at once.

Chicago, Ill.—The Imperial Box Company, 1566 West Carroll avenue, manufacturer of folding paper boxes and containers, has approved plans for new two-story and basement addition to plant, to be equipped for increased capacity. General erection 32 West Randolph street, and work will be placed under way at once. Cost estimated close to $50,000, incontract has been let to Holton, Seelye & Company, cluding equipment. L. E. Russell, 134 North LaSalle street, Chicago, is architect.

Chicago, Ill.—The Eastman Kodak Company, Kodak park, Rochester, N. Y., manufacturer of photographic papers and other processed paper stocks, films, etc., has plans under way for new branch plant on Prairie avenue near Seventeenth street, Chicago, consisting of a three-story and basement structure, estimated to cost close to $500,000, with equipment. Bids will be asked soon on general erection contract. Schmitz, Garden & Erickson, 104 South Michigan avenue, Chicago, are architects.

Fredericksburg, Va.—The Sylvania Industrial Corporation, 122 East 42nd street, New York, N. Y., manufacturer of cellulose transparent papers, is awarded miscellaneous contracts for work in new addition to mill at Fredericksburg, lately noted in these columns. Award for plumbing and heating has been let to James Semple, Jr., 708 Schuylkill avenue, Philadelphia, Pa. New unit will be one-story and is scheduled for completion in the fall. It is reported to cost over $45,000, with equipment. The Hughes-Foulkrod Company, 1505 Race street, Philadelphia, has the general erection contract.

Toronto, Ont.—Stanley Manufacturing Company, Ltd., 1074 Queen street East, manufacturer of metal foils for advertising and other service, plans early expansion in plant including installation of special embossing presses and allied equipment. Company is establishing a new division for the production of metal foil caps for liquor and beverage bottles, and similar specialties. Large increased capacity will be arranged. A manufacturing agreement has been consummated with Anderson & Bruun Fabriker, Ltd., Copenhagen, Denmark, manufacturer of metal foil products, to operate under the patents of that company. E. F. Clem is secretary and treasurer.

Champion To Build New Mill

At the special meeting of the board of directors of The Champion Paper and Fibre Company, held at the Company's office at Hamilton, Ohio, on Tuesday, August 8, complete approval was given to plans originated a number of months ago to build a paper mill adjoining the Company's present plant at Pasadena, near Houston, Tex. This new project, the Company's third paper manufacturing plant, will cost approximately three million dollars and will be utilized in the manufacture of high grade coated papers, coated on the paper machine at high speed, for Time and Life Magazines, as well as for standard grades at present manufactured by Champion.

The Fourdrinier paper machine, contracts for which have been let to Beloit Iron Works, of Beloit, Wisconsin, will involve an expenditure of approximately one million dollars, including the cost of the drive. The machine will have a wire width of 214 inches, will be 115 feet in length, and will trim 198-inches. The overall length will be approximately 400 feet. The installation, the world's largest combination papermaking and paper coating machine, will have four coaters and is capable of operating at 1500 feet per minute.

There is considerable supplementary equipment involved, including two very modern supercalender stacks in addition to two machine stacks which will be manufactured by The Black-Clawson Company of Hamilton, Ohio. These supercalender stacks will have ten rolls of 194 inches in width and will be the largest ever built in this country. They will be of extremely high speed, capable of operating 2000 feet per minute, this high speed being made possible through a new type of refrigeration, in order to care for heat dissipation. Each calender stack will have a 10-ton ice making machine. It is of interest to note that the calender stacks will be 30 feet in height, the necessary steel rolls being manufactured by the Midvale Company, of Philadelphia.

Brick Building To Match Sulphate Plant

The building to house the new installation will be of brick and steel construction to match the Company's present sulphate pulp plant built in 1937. The pulp plant has a capacity of 230 tons of bleached sulphate daily, utilizing southern pine grown in the vicinity.

The building has been engineered by Champion's force with H. K. Ferguson Incorporated, of Cleveland, Ohio, as consulting engineers and will be 140 feet by 828 feet. The new plant will be of two story construction, modern in every respect, with a three story finishing room and three story storage capacity. The new machine will be placed across the aisle from the existing 166-inch pulp machine, built by Black-Clawson. Merritt, Chapman and Scott, of New York City, are contractors for the building as well as for all necessary installation.

The winders are to be manufactured by Beloit Iron Works, and the Cameron Machine Company, of Brooklyn. The driving equipment is to be made by General Electric Company and other motors, switches, and incidental electrical equipment by Westinghouse Electric and Manufacturing Company.

Champion plans to commence building operations at an early date and expects to have its new plant in operation in approximately ten to eleven months.

TWO PAPER ASSOCIATIONS INDICTED AS TRUSTS

(Continued from page 15)

tainer Association, Southwestern Container Association, Northwestern Container Association, Pacific Coast Container Association.

Corporations Named

(2) Corporations engaged in the manufacture of corrugated and solid fiber board shipping containers who are, or during the period covered by the indictment were, members of the National Container Association and of one or more regional container associations, and who are alleged to have participated in the combination and conspiracy charged: Alton Box Board Company, American Box Board Company, Container Corporation of America, Downing Box Company, Eddy Paper Corporation, Federal Container Company, Fort Wayne Corrugated Paper Company, Robert Gair Company, Inc., Gaylord Container Corporation (successor to Robert Gaylord, Inc., and Bogalusa Paper Co., Inc.), Hinde & Dauch Paper Company, Hummel & Downing Company, Inland Container Corporation (Indiana), Iowa Fibre Box Company, The Jackson Box Company, Kieckhefer Container Corporation, F. J. Kress Box Company, Lawrence Paper Company, Loy-Lange Box Company, National Container Corporation (Del.), Niagara Corrugated Container Company, Inc., Rochester Folding Box Company, St. Louis Basket and Box Corporation, Scharff-Koken Manufacturing Company, Superior Paper Products Company, Wabash Fibre Box Company, Waldorf Paper Products Company.

Individuals Named

(3) Individuals alleged to have participated in the combination and conspiracy charged: G. G. Otto, M. B. Hall, W. M. Dixon, Walter C. Paepcke, C. W. Evert, T. C. Mitchell, H. M. Treen, E. Victor Donaldson, J. M. Arndt, C. W. Gaylord, J. H. MacLeod, Sidney Frohman, E. A. Walther, H. C. Krannert, R. N. Hoerner, W. J. Cassady, Sr., F. J. Kress, Irving Hill, S. K. Loy, Samuel Kipnis, Louis Rosenfeld, H. C. Stevenson, Joseph Ondr, M. C. Hamilton, A. E. Miller, C. G. Maher, Charles R. Stevenson, C. H. Ferris.

Pulp Production Highest in Three Years

Revised estimates of the Forest Products Division of the Department of Commerce place the production of woodpulp in the United States for the first six months of 1939 at 3,479,455 tons.

This amounted to a 27 per cent increase over the production in the corresponding first six months of 1938, and was slightly above the production for the first half year of 1937.

June production of wood pulp totaled 594,000 tons, a decrease of 4 per cent below the May production, but higher than the production in June 1938.

Imports of wood pulp for the first six months of 1939 totaled 833,744 tons, an increase of 15 per cent over the quantity imported in the first six months of 1938, but 27 per cent below imports in the first half of 1937.

PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Vol. 109 New York, August 17, 1939 No. 7

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Syracuse Hotel, Syracuse, N. Y., September 12-14.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Atlantic City, N. J. October 16-20.

BUSINESS ON UPTREND

Business men are justified by basic factors to feel encouraged and view the future with more confidence. Rising business activity, after the minor declines in April and May, has brought industrial production back to approximately the level which prevailed during the first months of this year. For example, on January 2 the index of general business activity stood at 92.6 per cent, compared with 78.3 per cent for the same date in 1938. At the end of the first quarter of this year the index had declined to 88.5 per cent. During the first six months of 1939 the index advanced to 91.3 per cent and for the week ended July 29 was 91.2 per cent.

The Federal Reserve index is 7 per cent below the high point of 1938, which occurred in December. The recovery since last May, as estimated by the United States Department of Commerce, brought an increase in the national income to $5,700,000,000 in June, compared with $5,400,000,000 for June 1938. National income for the first six months of this year is 3 per cent higher than for the corresponding period last year. Estimates for the full current year place the national income at between 66 and 67 billion dollars, against 65 billions in 1938. This falls far short of the 71 billions in 1937 and some 20 per cent under the 1929 figure of 80 billions, which is the goal mentioned by President Roosevelt as the starting point where he will begin balancing the budget.

The increase in the demand for consumer goods this year, and the primary reason why the paper industry is currently estimated to be operating about 15 per cent higher than last year at this date, is due to the demand for consumer goods. And much of the increased consumption of paper and paper products, and other consumer goods, is attributed to the increased payments to workers in salaries and wages. The income gain thus far this year has accrued to labor. While compensation to workers has increased over a billion dollars, the receipts from business, investments and property has declined one-half billion of dollars.

In studying the compensation of labor over a period of years it is shown that the increase in the percentage of national income paid to workers has been almost interrupted since 1932, when labor's compensation was under 64.0 per cent of the national income, to gradually rise to 67.3 per cent in 1938, and to an estimated 68.0 per cent in the current year. Relief payments in 1938 contributed 7½ per cent to labor's compensation. Excluding relief, the labor income for 1938 amounted to 65.5 per cent, compared with 65.8 per cent in 1929. While no authoritative data are available for this year, no important change has probably occurred since last year. In commenting on the present business outlook the August issue of the *Business Bulletin* published by La Salle Extension University says in part: "Business is sometimes basically better than it feels. The upward movement extended over a year with only one significant interruption. According to the present outlook, the average of 1939 will be considerably above that of 1938, although below 1937".

Conservative trends in Congress should encourage American business, Howard Coonley, president of the National Association of Manufacturers said in a letter to members of that association. "Surely, ten years of continuous depression", Mr. Coonley said, "should make it crystal-clear to politicians and public alike, that recovery awaits the correction of things done wrong. The effect of ten years' experimentation with our economic machinery cannot be overcome, even with the best of intentions and the most determined efforts of business management, until those experiments are abandoned, or adjusted to experience. It has been aptly said that the greatest of all reforms is the undoing of things done wrong".

In emphasizing that business should have nothing but the greatest commendation for the encouragement which Congress did afford and stressed that his letter was meant in no sense to diminish the credit deserved by the national legislators, Mr. Coonley said in reference to the National Labor Relations Act: "Let us be quite frank in saying that failure to amend the National Labor Relations Act, in the face of such evidence as was produced before Congress, and with public sentiment overwhelmingly for change, can be considered a serious setback to business. Investigation of the National Labor Relations Board is important, but it does not remove the drawbacks to employment involved in the defects of the Wagner Act."

In summarizing the future, Mr. Coonley sounded

a note of confidence, saying in part: "I am convinced that business will derive encouragement and confidence from existing congressional trends. Many obstacles to recovery still remain, it is true, but I know from past experience and intimate contact with members of the National Association of Manufacturers that industry will make every effort to move forward despite them. I know it is not necessary to urge that all members of the NAM examine carefully their present and near-future production demands in order to determine whether there is any possibility of providing employment for more people at the present time or in the near future. Such action is timely because of the belief currently expressed in several quarters that there will be considerable increase in industrial production during the balance of the year, and also because industry must do its utmost, within the limitations of permissible volume of production, to translate relief rolls into payrolls."

Finland's Paper Shipments Reach Record

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 16, 1939—Shipments of paper from Finland during April amounted to 59,730 tons, the highest on record for any month this year, according to the Forest Products Division, Department of Commerce.

Total exports of paper from Finland during the first five months of the year amounted to 283,978 tons. By comparison, United States exports of paper were about 109,000 tons, or 62 per cent less than Finland's.

Low stocks in importer's hands, necessitating new purchases for early delivery, resulted in the increased exports from Finland.

Mechanical wood pulp shipments from Finland for the first five months of this year amounted to 154,452 tons, an increase of 20 per cent over the amount shipped in the corresponding first five months of 1938.

Chemical wood pulp exports from Finland totaled 415,213 tons, a decrease of 11 per cent from the amount shipped in the same period in 1938.

Imports of wood pulp from Finland amounted to about 15 per cent of all wood pulp imports into the United States in 1938. In 1937, the United States imported 21 per cent of its wood pulp from Finland.

U. S. Paper Production Increases

Production of paper and paperboard in the United States during the first six months of 1939 totalled 6,565,740 tons, or 19 per cent more than was produced in the coresponding six months of 1938, the Forest Products Division of the Department of Commerce announced last week.

The 6,565,740 tons of paper and paperboard produced was only 10 per cent lower than the peak production year of 1937, and was 17 per cent greater than the total produced in the first six months of 1936.

June production of paper and paperboard amounted to about 1,066,390 tons, or 14 per cent less than the May production. This was slightly greater than the production in June, 1938, and slightly less than the June, 1937 production.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1939	1938	1937	1936	1935	1934
January	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	79.5%	66.0%	87.3%	80.7%	72.3%	.....
July	74.7%	72.0%	81.8%	77.3%	64.9%	.....
August	.....	77.2%	82.9%	81.5%	70.9%	.....
September	.....	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average...	.....	72.3%	80.6%	81.3%	70.5%	.....
First 31 weeks..	80.2%	68.3%	88.7%	78.9%	69.0%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1939		CORRESPONDING WEEKS, 1938	
July 1	81.1%	July 2	68.8%
July 8	56.3%	July 9	58.9%
July 15	81.0%	July 16	75.7%
July 22	80.6%	July 23	76.3%
July 29	81.7%	July 30	77.1%
August 5	79.4%	August 6	73.2%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	July 1, 1939	July 8, 1939	July 15, 1939	July 22, 1939	July 29, 1939	Aug. 5, 1939
0% to 50%	64	146	67	66	66	45
51% to 100%	241	158	233	231	216	152
Total Mills Reporting..	305	304	300	297	282	197

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1935	62%	68%	68%	63%	61%	66%	62%
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1935	67%	71%	77%	71%	61%	66%
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%

Week end. July 1, 1939—70%
Week end. July 8, 1939—42%
Week end. July 15, 1939—71%
Week end. July 22, 1939—70%
Week end. July 29, 1939—70%
Week end. Aug. 5, 1939—70%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

To Build New Paper Mill in Chile

Formation of a company which expects to have a wood pulp and paper mill completed early in 1940 has been reported from Santiago, Chile, to the Forest Products Division of the Department of Commerce.

At the same time, the Commerce Department was informed that Netherlands interests are contemplating construction of a new paper mill in West Java to produce low-priced packing paper. Rice straw will be used as the raw material during the initial stages of operation.

The Chilean mill, in addition to producing wood pulp and insulating material, plans to make paper for magazines, blank books and similar uses. It was reported that the company has acquired 45,000 acres of timberland from which a soft wood known as olivo will be obtained. This represents the first serious attempt to manufacture paper from softwood trees which are numerous in south central Chile.

with an ADKA SAVEALL

Experienced mill men know that a thirsty paper machine turns out poor work. Give the machine operator all the water he wants and production goes merrily along with a minimum of breaks, rejects and spotty sheets.

Here's where the ADKA Saveall enters the picture and helps paper mills face constant or periodic water famines. For the ADKA will definitely clean up white water so that it may be reused on showers, thus reducing fresh water make up to a constant minimum amount.

White water flows generally increase 15-25 percent after an ADKA is installed, because it pays to give the operator free rein on his shower water once the ADKA has stopped the water famine. The installed cost is usually repaid in a year or two through savings in stock and water, not to mention better all around machine operation.

OTHER ADKA ADVANTAGES

Stream Pollution

ADKA effluents contain only 0.2 to 0.4 lbs. of stock and filler per 1000 gals.

Profits from Stock Recovery

ADKA's make the highest recoveries of all save-alls on the market—95-98 per cent.

Of nine installations investigated recently, 3 were returning the installed cost in 6 months; 2 in 12 months; 1 in 15 months; 2 in 18 months and another in 21 months.

AN ACTUAL CASE

One of our clients had just such a problem—a shortage of fresh water at certain periods of the year. Two ADKA's now reclaim 1150 GPM of white water for reuse on the paper machines and showers—have stopped the water shortage—have made possible the use of 250 GPM more of water on the machines than before.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

New Surface Active Chemicals*

By B. G. Wilkes[1] and H. F. Robertson[1]

Abstract

A classification of types of surface active chemicals and wetting agents together with suggested applications in the pulp and paper industry.

The paper and textile industries use more water in the processing of their products than do other branches of manufacture. It would be expected, then, that each of these industries should be vitally concerned with and, perhaps, profoundly affected by any technical improvement in the speed and effectiveness with which water can be made to perform its various functions. Such an improvement has appeared during the past few years in the form of commercially available, polar or surface-active compounds designed for use as wetting agents, penetrants, detergents, and emulsifying and spreading agents.

Although textile processors have quite rapidly and widely adopted the use of these surface-active materials, the paper industry appears to have considered the idea of their use with reticence. The expense of treating large volumes of water with wetting agents, in order to process comparatively small weights of pulp or paper, may explain partially this hesitancy, but, whatever the cause may be, the resulting current situation is a lack of accurate and specific data to guide the paper mill man practically in the most judicious utilization of these new aids to aqueous processing. It is encouraging to note, however, that there is evidence lately of interest in these commodities on the part of laboratories and technical centers of the paper industry, and it is anticipated that the results of investigations under way will point the way to the manner in which wetting agents can most advantageously be employed by paper manufacturers and converters. Until such studies have been completely enough pursued, it is not in order to attempt the making of specific recommendations, nor is it the purpose of this paper to do more than present a general account of the chemical nature and physical activity of socalled wetting agents, with particular reference to one type, which are designated as the "Tergitol"[2] penetrants. A trite but very sensible approach to such a general discussion of surface-active materials would be to propound the question, "What are wetting agents and why should they be employed in aqueous processes?".

Fatty Derivatives

Primary responsibility for the commercial origin of the recent development of surface-active chemicals can be traced to the interest of the textile industry in improved processing compounds. The sensitivity of soap to acidic and hard waters is common knowledge and it was this property that the new synthetic penetrants and detergents were intended to eliminate. Surface activity, or surface and interfacial tension reduction, and its relationship with the chemical structure of soaplike materials, is now rather generally understood and widely accepted. Soaps and other materials which behave in similar fashion in water solution are strongly polar compounds, consisting of a non-polar, hydrocarbon portion of high molecular weight, at some point in which is located a sufficiently polar or water-soluble group to endow the molecule with the property of at least colloidal solubility in water. The position of the polar, hydrophilic group in the molecule may vary; but in soaps and soap substitutes derived from fatty materials, this group is generally located at one end of a long, straight-chain, hydrocarbon molecule. In the case of soaps, it is this water-soluble group which is responsible for their sensitiveness to the precipitating action of hard waters and their instability in the presence of acids. Chemical alteration of this group, by which these objectionable properties are remedied, can be accomplished by several methods. Fatty esters may be hydrogenated, for instance, and the resulting fatty alcohols then sulphated. The resultant primary alcohol sulphates closely resemble the corresponding soaps in such practical exhibitions of surface-activity as detergency, wetting, emulsification and penetration.

Additional members of the class of surface-active products, which may be said to comprise only the primary polar, fatty type, include such compounds as result from the sulphation or sulphonation of fatty acid esters and amides and of the ethers of fatty alcohols. As a class, these fatty derivatives may be looked upon with favor in many processes which require the detergent action of soap, but which will not tolerate the several shortcomings of the latter.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.

[1] Mellon Institute of Industrial Research, Pittsburgh, Pa.

[2] The word "Tergitol" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

Synthetic Products

Equal prominence in other than the detergent field of surface-activity has been accomplished by a structural type of polar compounds distinctly different from the above-mentioned fatty group. A most unusual group of this second type of surface-active materials are the sulphates of synthetic, secondary alcohols of high molecular weight. The sodium salts of such secondary alcohol sulphates, now known commercially as the Tergitol penetrants, have been found to possess very remarkable properties of wetting and penetration, the magnitude of which is conditioned primarily by the molecular weight of the alcohol from which each member of the group is derived.

On the basis of similarity of chemical structure, other secondary polar type compounds, such as sulphated or sulphonated esters of dibasic acids and the numerous alkyl aromatic sulphonates, might well be expected to resemble the Tergitol penetrants rather than the primary, fatty type of polar compounds in their properties of surface activity. Examination of the wetting action of the Tergitol products and a representative list of the other structural types of surface-active compounds which are commercially available has produced evidence in support of this contention. Distinct differences in the wetting activity of such products can be correlated with the position of the water-soluble or polar groups with respect to the non polar or hydro carbon portion of the molecules. On the basis of such differences in wetting activity it is possible to divide the investigated products into two classes, each of which has its primarily important properties and outstanding utility. The following tabulation presents the gross chemical structure of the types of products comprising these two groups:

Type No.	Group A	Type No.	Group A
A-1	R—COONa	B-1	$R^1 \diagdown CHSO_4Na$ $R^1 \diagup$
A-2	R—SO_4Na		
A-3	R—CONH$C_2H_4SO_3$Na	B-2	R^1—OOC—CH_2 R^1—OOC—$CHSO_3$Na
A-4	R—COO$C_2H_4SO_4$Na		
		B-3	R^1—Ar—SO_3Na

R = fatty alkyl group; R^1 = primary or secondary, non-fatty alkyl group;
Ar = aryl or aromatic group.

In group A are listed the various types derived from fatty sources—specifically, soaps, fatty alcohol sulphates, and sulphated fatty acid esters and amides. The polar or water-soluble grouping in all these compounds is a primary one, located at the end of the nonpolar portion of the molecule. In contrast, group B presents the available types of the more truly synthetic surface-active compounds, including the secondary alcohol sulphates, sulphonated esters of higher alcohols and dibasic acids, and the numerous alkyl derivatives of aryl or aromatic sulphonates. Each of these types contains its polar group in a secondary position with the nonpolar portion extending from it in two directions.

Experimental Observations

Classification of surface-active compounds on the basis of polar group position within the molecule, as shown in the above table, is justified by experimental observations on their wetting action, detergency and emulsifying power. The remarkable detergent and emulsifying action of soaps is generally known.

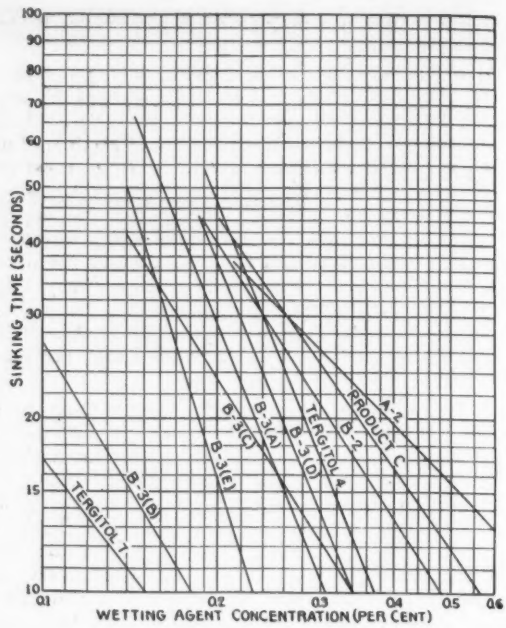

FIG. 1.
Cotton Wetting Action of Various Commercial Penetrants in Aqueous Solution at 25 deg. C.

These same properties are also characteristic of other members of group A (*1-4*) which are widely employed substitutes for soap in scouring and dispersing applications. However, those types which appear in Group B, although somewhat inferior in point of detergency, have been found (*5*) to be decidedly superior to the Group A products in the role of wetting agents and penetrants. In aqueous systems containing compounds of Groups A and B and possessing equivalent surface and interfacial tension values, solutions of the Group B secondary polar compounds have been consistently shown to have better wetting and penetrating action than have the primary polar compounds of Group A.

Data which support the contention that the position of the water-soluble group with respect to the rest of the surface-active molecule can be correlated with certain definite properties are best presented in the form shown in Fig. 1. This graph shows experimental wetting times plotted as a function of wetting agent concentration. In determining these data, the Draves (*6*) wetting test was applied to a large group of commercially available surface-active products in which members of each of the representative types of Groups A and B were included. The technique of this test, now accepted as a standard by the textile industry, involves the determination of the time required for a 5.0-gram skein of cotton yarn to sink when weighted with a 1.5-gram sinker and submerged in wetting agent solutions by means of an anchor. Were it to appear necessary or desirable, a similar test procedure might be evolved in which paper is substituted for cotton yarn. The curves of Fig. 1 represent the wetting efficiencies in aqueous solution of all the products tested which were active enough to produce wetting times of approximately 12 seconds at a concentration of not more than 0.6 per cent. The chemical type of each surface-active material used in determining these curves is indicated by a designa-

tion which corresponds with those shown in the type classification table.

Most efficient of the wetting agents included in Fig. 1 are those whose wetting time-concentration curves lie in the region closest to the origin of the axes. The secondary alcohol sulphate product, Tergitol penetrant 7, will be observed to be the most unusual in this respect, while other products, which are also members of the secondary polar Group B, are closely related to it in point of wetting efficiency. In contrast, it is pertinent to note that only one product of the primary polar Group A, or fatty type, shows sufficient wetting merit to be represented by a curve in this figure and position of the curve (*A-2*) on the chart is indicative of only mediocre efficiency.

By tabulating from Fig. 1, and from similar charts of wetting curves determined under acidic and alkaline conditions, the concentrations of various surface-active products which are required to produce an equal and arbitrarily chosen sinking time, it is possible to assemble data such as presented in Table I. The most effective products, under each of the conditions included in this table, are those which require the smallest concentration to induce a wetting time of 12 seconds. Blank spaces in Table I indicate sinking times greater than 12 seconds at all concentrations less than 0.60 per cent.

TABLE I.—CONCENTRATION OF WETTING AGENT NECESSARY TO PRODUCE 12-SECOND WETTING TIMES AT 25 DEG. C.

Wetting Agent Type	Product	Water Soln.	1% H_2SO_4 Soln.	5% H_2SO_4 Soln.	0.5% NaOH Soln.	1% NaOH Soln.	2% NaOH Soln.
		Per cent by weight					
B-1	Tergitol 7	0.13	0.21	...	0.22	...	...
B-1	Tergitol 4	0.34	0.22	0.24	0.32	0.19	0.19
B-2	.....	0.43	0.53	...	...	...	...
B-3	A	0.28	0.25	...	...	...	...
B-3	B	0.16	0.14	0.18	...	...	...
B-3	C	0.30	0.24	...	0.39	0.38	0.46
B-3	D	0.32	0.26	0.24	0.33	0.29	...
B-3	E	0.22	0.16	0.20	0.20	0.19	...

Examination of Fig. 1 and Table I would suggest that the Tergitol penetrants behave most effectively in that either one or the other of this family of products functions extremely well in neutral, acidic and alkaline solution. Comparative superiority of Group B compounds over those types represented by Group A, as disclosed by wetting tests of this sort, is of greater technical significance than any apparent difference in the merit of the individual products of which Group B is composed. The sense of such a statement will be apparent when one considers the fact that the wetting time of a superior penetrant, one of the Tergitol penetrants, for instance, can be equalled or perhaps surpassed by use of an inferior wetting agent *provided a sufficiently high concentration of the latter is employed.* Therefore, any evaluation of the comparative merit of several wetting agents in an industrial process, and particularly in the paper industry, must concern itself not only with "how little of the material can be used to accomplish a given purpose?" but also with "how much does the material cost?"

When a numerical value, representing the concentration of a wetting agent required to perform a given function, is multiplied by the price of the wetting agent, a figure is obtained which is now popularly called the "money value" of the penetrant. Money value figures afford a basis of comparison between surface-active materials which takes into account both the factors of behavior and price. It is unfortunate, but true, that prices fluctuate and that manufacturers often find it necessary to make technical changes which alter the efficiency of their products. The utility of money value comparisons, therefore, is more or less confined to critical studies of small groups of products which the user feels are best suited to his particular process.

Applications

There is an astonishingly large number of surface-active compounds now available in commercial quantities, some of which are essentially wetting, penetrating and spreading agents and others which are primarily detergents and finishing compounds. In the former group, the Tergitol penetrants exemplify the superior wetting activity which is typical of those high molecular weight, capillary active compounds wherein the water-soluble group is located near the center of the non polar hydrocarbon system rather than at either end. In the latter group of primary polar compounds of fatty origin, the sulphated fatty alcohols would seem to be the most popular, judging from the many trade names under which various compositions of these compounds are marketed. In this connection, a comprehensive list of the trade designations of more than 150 surface-active products, which are made and marketed in this country, has very recently been compiled and published (*7*). As the chemical classification of most of the products is included, this listing should prove to be of considerable value as an aid to predicting whether the predominant merit of each compound is wetting action or detergency.

With such a great number of surface-active products available for use by the paper manufacturer and the paper converter, it will be appropriate to mention certain phases of paper technology wherein wetting agents have already demonstrated their merit and to speculate concerning additional manufacturing and processing operations which may ultimately be benefited by the use therein of these surface-active materials.

Penetrants have already been adapted to the processing of certain absorptive paper materials such as towels, blotting paper and cleansing tissues. Impregnation with very small concentrations of Tergitol penetrants 4 or 7, for example, promotes greater speed of water absorption by towel stock and increases its absorptive capacity. It is reported that satisfactory impregnation may be accomplished by either spraying or dipping. In contrast to paper treatments of this sort wherein the stock is profoundly impregnated, it should be possible, by carefully controlled use of surface-active agents, to utilize their "spreading" properties without inducing excessive penetration of the subsurface structure of papers; therefore, more uniform and complete coverage of papers with aqueous casein and other compositions employed by the converter should result from the presence therein of surface-active materials.

A variety and volume of usage, still greater than that offered by paper finishing and paper specialty processing, should eventually be found in the many operations by which paper raw materials are now prepared. More rapid wetting and penetration are phenomena which should effect in desirable fashion the pulping of wood chips, linen and cotton rag cooking and bleaching, pulp defiberizing or beating, and deinking processes in the recovery of old paper.

One of the obvious restrictions to the popular use of surface-active materials in several of these processes is that quite large quantities of water are employed for the treatment of relatively small amounts of paper pulp. Current mill practice does not provide for the recycling and continual use of these baths; hence, unspent and unrecoverable wetting agent would be sewered or otherwise disposed of and unattractive costs, per unit weight of treated pulp, would result. Agitation and legislation against stream and river pollution, however, is constantly increasing and it is not improbable that pulp-treating methods, designed to substantially lower the volume of water which flows through the average paper mill, will be a widely practiced development of the future. Process modifications along this line will undoubtedly stimulate additional interest in the application of penetrants to pulp-treating operations.

Discussion has thus far been confined to those polar compounds of high molecular weight which possess water solubility and surface-active characteristics by virtue of the presence in their molecular structure of sulphate or sulphonate groups. Industrial developments of the past decade have been concerned primarily with the production and utilization of this type of surface-active compounds, which in water solution yields positively charged metallic ions and negatively charged colloidal ions or ion aggregates. It is these latter, alkyl sulphate anions which are responsible for the surface-active behavior of the sulphonated or anionic penetrants.

In contrast to those substances which form active anions, there is at present being developed an extensive group of compounds which in water solution produce surface-active cations. Being essentially acid or quaternary salts of high molecular weight amino compounds, they produce by ionization surface-active cations of the substituted ammonium type. Although it is not to be expected that these amino compounds will be generally popular substitutes for the various sulphated products in the roles of wetting agent and detergent, they do possess several unique properties which are already beginning to establish their commercial value.

An outstanding property of cationic substances is their tendency to adsorb on hydrophilic surfaces, particularly on cellulosic structures such as paper, cotton and rayon. Like substantive or direct dyestuffs, they are preferentially removed or exhausted from even very dilute aqueous solution by their deposition upon cellulosic structures. This phenomenon is finding widespread application in the textile industry, particularly for the finishing of fabrics and yarns. Surface finishes of unusual softness, having improved fastness to washing, can be obtained with aqueous baths from which the cationic product is completely exhausted during the finishing operation. Cellulose surfaces, when coated with a cationic film, acquire an affinity for anionic or negatively charged substances, the film serving as a strongly adhering mordant. In this manner cellulose structures can be provided with affinity for acid dyestuffs. Among other interesting, novel effects, it is possible to deposit adherent films of rubber on a cationic impregnated cellulose surface by immersing it in rubber latex dispersions.

The well established merit of the sulphated wetting agents, together with the intriguing and incompletely explored behavior of the cationic compounds, suggest a more extensive use of surface-active chemicals by the paper industry in time to come.

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Rayon and Staple Fiber Handbook

The third edition of the Rayon and Staple Fiber Handbook has just been issued by the Rayon Handbook Company of New York, cloth bound, size 5½ x 7¾ inches, 832 pages, 22 chapters, 300 illustrations, photomicrographs, tables and charts. Compiled and edited by E. W. K. Schwartz and H. R. Mauersberger.

Although a large part of the book deals with rayon as a textile material there are numerous sections of interest to men in the pulp and paper industry. Beginning with two excellent chapters on the historical, statistical and economic background of the industry the book proceeds with chapters on raw materials and their preparation, the principal yam manufacturing processes, including staple fibers. The balance of the book deals with description of methods of handling such fibers as textile materials.

There are five chapters on physical, chemical tests and microscopical methods of identification. The chapter on raw materials is written by Sigmund Wang of the Canadian International Paper Company. This chapter relates to the chemical constitution of cellulose, kinds of cellulose, outline of the procedure for making sulphite pulp. There is also material on cellulose from cotton linters.

The Rayon Handbook may be obtained at $4.50 per copy in the United States and Canada and $5.75 in foreign countries, from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd Street, New York.

Project Paper Mill in Waterloo Area

According to a report in the *Times* of Florence, Ala., "Gorden Browning, former governor of Tennessee, and Mayor Bob Guinn, of Savannah, Tenn., spent all day Friday in Florence in the interest of plans calling for the construction of a several million dollar newsprint mill between Waterloo, West Lauderdale county, and Savannah.

"It was reported that the former governor and Mayor Guinn, who are backing the proposal, have decided not to place the mill at Iuka, Miss., as originally planned, but rather on the north side of Pickwick Lake because the raw materials on the north bank of the lake are reported to be much better and more widespread.

"According to reports here the two men spent yesterday in the office of D. J. Edwards, Florence, conferring with Florence and Lauderdale county persons and property owners who have large land holdings in the section where it is proposed to establish the new industry.

"Informed persons said the former Tennessee governor and Savannah mayor are taking options on lands involved and buying others and that 60,000 of the 75,000 acres required have already been optioned or purchased."

The Commercial Operation of the Sveen Pederson Save-All*

By Ward D. Harrison[1]

Abstract

The application of the Sveen-Pederson save-all for the recovery of stock and filler from white water is described. The principles and theory of its operation are discussed briefly. The results obtained in commercial operation in this country are given, while some points of a study of its variables made by foreign researches are quoted.

The results indicate that the save-all is very efficient and can be used over a wide range of conditions.

Introduction

A new save-all, the Sveen-Pederson, has been put to use in this country during the past year and shows considerable promise. This save-all is of the flotation type and the separation of stock from clarified effluent is made possible by first flocculating the suspended solids with a colloidally active glue, Sveen glue, then forcing these solids to raise to the surface with air bubbles which have attached themselves to the agglomerated particles, and finally scraping the solids off the surface by mechanical means.

This system has several advantages as follows:

1. The time of circulation through the save-all is short.
2. The efficiency is high even on heavily loaded or slow stock.
3. The save-all is open and therefore it is easy to clean.
4. The save-all is insensitive to fluctuations in quantity and concentration of incoming white water.
5. The save-all has a high thickening power.

This save-all works between an artificial pressure and the normal atmosphere and the inventor, Nils Pederson, a Norwegian engineer, was first of the opinion that it would be sufficient to use only the air, water, pulp combination to make an efficient recovery. However, from a practical standpoint, success was not obtained until Karl Sveen invented and recommended the colloidally active glue which bears his name as a pretreating chemical. This glue is made up of animal glue, rosin size, alum, and formaldehyde.

This save-all was patented as early as 1924 in Norway and 1925 in Germany. There are some 50 of these save-alls in operation in Europe, but not until early 1937 was the idea applied in the United States. The first article concerning the Pederson save-all appeared in 1920 in the Swedish trade literature *(1)*. Since 1930, however, articles by Pederson and Sveen *(2) (3)*, Juell *(4)*, Loddengaard *(5)*, Sucksdorff *(6)*, Vuorisalo *(7)*, Brecht and Rausch *(8)*, and Brecht and Scheufelen *(9)* have appeared.

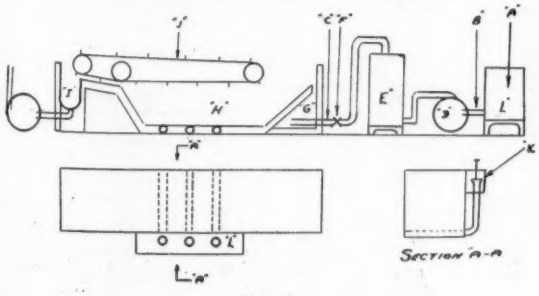

FIG. 1
Flow Diagram.

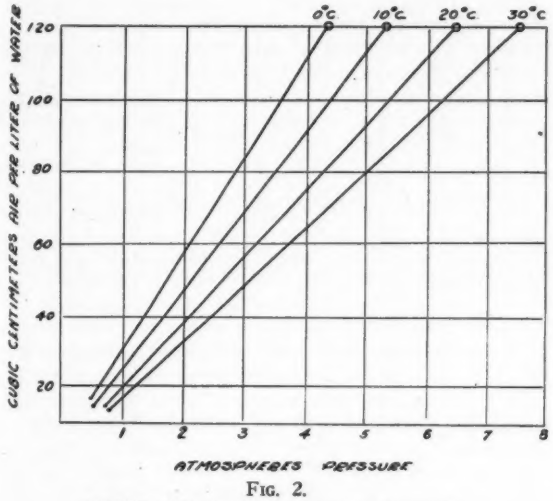

FIG. 2.
Solubility of air in relation to pressure temperature.

Description of the Save-all

The white water (A) from the paper machine flows by gravity into a collecting tank (L) where it is sucked into a pump (D) along with air entering at (B). (See Fig. 1.) The air and water system is pumped under pressure into the retention chamber (E). After remaining the required time in this receptacle, the white water-air system is released to atmospheric pressure through a spring loaded valve (F) into the open vat of the Sveen save-all (H) along with a quantity of Sveen glue which has been added at point (C). In the baffled part of the save-all (G) the white water, air and glue mixture finally flows in a quiet manner into the flotation part of the save-all. The solid materials in the white water are floated to the surface and scraped off with the mechanical scrapers (J). The clarified water going to the bottom is led into an adjoining box (L) through connecting tubes (K) which have vertically adjustable rims and therefore can be used to regulate the head in the save-all.

Pretreatment of the White Water and the Theory of the Flotation Mechanism

Glue Treatment

As previously pointed out, the solids in the save-

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.

[1] Member TAPPI, Riegel Paper Corporation, Milford, N. J.

all are lifted to the surface by the air bubbles. However, the solids have been pretreated so that the air bubbles can take a hold and lift. This pretreatment has to be done with Sveen glue which changes the colloidal chemical properties of the white water. The reaction is not entirely understood but the glue treatment does agglomerate the solids in the white water. This agglomeration may require the use of a trivalent-ion such as is found in ordinary paper makers alum, but in most cases the mill water contains enough electrolyte without any such addition. A content of electrolyte is not only necessary for the flocculation but also for supplying the necessary positive charge to the air bubbles so that they will attach themselves and hold fast to the agglomerated negatively charged solids. In addition, the glue flocculation of the solids produces a mat on the surface of the white water and decreases the rate of escape of air from the solution and therefore allows the solids to become completely floated and scraped off before the air has completely been released from the system.

Air Treatment

The air bubbles in the white water during the clarification are made possible by dissolving air in the water under pressure and then releasing the pressure. Such a system is governed by Henry's law which states that at higher pressures more gas is soluble in a liquid than at lower pressures and that for a given pressure more gas is soluble in a liquid the lower the temperature. This relationship for the air-water system is shown in Fig. 2 for several temperatures.

Operating Conditions and Results

The save-all in question was designed to handle 500 gallons of water per minute but will handle as high as 750 gallons per minute with little decrease in efficiency. The save-all is working on a 160-inch fourdrinier machine making sulphite and glassine papers both filled and unfilled. All the water from the suction boxes, suction couch, suction presses, and wire showers is clarified by the save-all and the effluent is reused to the extent needed as shower water on the paper machine. Clarified water not used back into this system averages 300 gallons per minute. Other conditions and results are as follows:

Space Required and Construction

This particular installation required floor area 26 feet long by 13 feet wide. The save-all vat is constructed of reinforced concrete while the scrapers are wood.

Power Requirements

The scrapers are driven by a one-half horsepower motor through a gear reducer and chain drive. The water is pumped to and away from the save-all with pumps requiring 30 horsepower motors.

Glue Requirement

Glue is added at the average rate of 1½ pounds per hour or 1 pound per ton of paper produced. The Sveen glue solution is prepared with Sveen glue, rosin size, alum, and formaldehyde at 1 per cent concentration and allowed to age for 24 hours before using. The total cost of chemicals is approximately 17c per ton of paper produced or a little more than ½c per 1,000 gallons of water treated.

Glue and Air Application

The glue solution is metered into the white water by use of a constant orifice-variable head device and the amount of air introduced is controlled by regulating the pressure of compressed air on a standard orifice.

Retention Period and Pressure of White Water

As stated above the amount of air dissolved in water is dependent on pressure and temperature. The amount of air taken up by the water in this particular system is controlled by the amount of air added, the pressure of the white water, and the retention period under pressure. The water is held under pressure for at least one minute. Optimum pressure in this case is between 30 and 40 pounds per square inch although good results have been obtained on unfilled white waters with pressures as low as 15 pounds per square inch.

Results

Typical results of this system for various grades are shown in Table I. In addition, the decrease in biochemical oxygen demand of the intake as compared with the effluent has in one case amounted to more than 90 per cent, while the efficiency of this equipment in the removal of dissolved solids varies between 9 and 30 per cent. Insufficient B.O.D. tests have been made, however, to make a general and conclusive statement in this regard. The results for two tests on dissolved solids and B.O.D. are shown in Table II.

TABLE II.

Grade	Treating Rate-Gal. Per Min.	5 Day B.O.D. p.p.m. Intake	5 Day B.O.D. p.p.m. Effluent	Dissolved Solids p.p.m. Intake	Dissolved Solids p.p.m. Effluent
Glassine	500	267	5	660	600
Opaque waxing	500	297	189	520	390

Conclusions

Knowing the loss of clarified water from the

TABLE I.
Pounds Per 1000 Gallons

Grade	Treating Rate—Gal. Per Min.	Intake Total	Intake Fiber	Intake Filler	Effluent Total	Effluent Fiber	Effluent Filler	Per Cent Efficiency Total	Per Cent Efficiency Fiber	Per Cent Efficiency Filler
20 lb. waxing	500	..	1.75	..	..	0.00	..	..	100.0	..
17½ lb. waxing	500	..	2.90	..	..	0.08	..	..	97.2	..
30 lb. sulphite	500	..	2.66	..	..	0.00	..	..	100.0	..
39 lb. dry wax sulphite.	500	..	3.71	..	..	0.13	..	..	96.5	..
23 lb. opaque waxing ..	500	9.18	3.41	5.76	0.23	0.08	0.15	97.5	97.7	97.4
23 lb. opaque waxing ..	500	5.49	2.17	3.32	0.15	0.08	0.07	97.3	96.3	97.9
23 lb. opaque waxing ..	500	3.97	1.82	2.15	0.28	0.18	0.10	93.0	90.1	95.3
23 lb. opaque waxing ..	500	4.68	2.13	2.55	0.23	0.13	0.10	95.1	93.9	96.1
23 lb. opaque waxing ..	500	5.71	2.37	3.34	0.29	0.15	0.14	94.1	93.7	95.8
23 lb. opaque waxing ..	500	5.08	2.35	2.73	0.06	0.03	0.03	98.8	98.7	98.9
25 lb. glassine	750	..	1.00	..	..	0.08	..	..	92.0	..
25 lb. glassine	750	..	1.10	..	..	0.10	..	..	90.9	..
26 lb. opaque waxing ..	750	5.72	2.00	3.72	0.47	0.06	0.41	91.8	89.0	97.0

system (300 gallons per minute), it can be calculated from Table I that the average loss is only 3.8 pounds of solids per hour for filled white water and 0.9 pounds of solids per hour for unfilled white water when the save-all is handling its rated capacity (500 gallons per minute). When running at 50 per cent above rated capacity, the average loss is 8.5 pounds per hour for filled white water and 1.6 pounds per hour for unfilled white water. These amounts are negligible in comparison with losses on wash-ups.

From Table I it may be concluded that an unfilled white water would contain not over 0.2 pound solids per 1,000 gallons in the clarified effluent provided the intake does not contain over 4.0 pounds solids per 1,000 gallons and that on a filled white water would contain not over 0.3 pounds solids per 1,000 gallons in clarified effluent provided the intake does not contain over 9.0 pounds solids per 1,000 gallons while running at rated capacity.

Tests on biochemical oxygen demand reduction show that the save-all is capable of making substantial reduction in this respect.

The reduction of dissolved solids, to any great extent, however, has not been proven.

Work of Scheufelen

During the summer of 1937 K. Scheufelen carried out some experiments on the variables of this save-all which have checked the writer's experience in so far as he has gone. The results of this study were published by W. Brecht and K. Scheufelen in the April 8, and 15, 1938, issues of Der Papier-Fabrikant. This investigation has been presented in a very complete and concise manner and therefore liberty has been taken in quoting directly its most important point in order to portray a more complete picture of what is known today concerning the possibilities of this save-all.

1. The *p*H Value

The influence of *p*H on the efficiency is given in Fig. 3 for both a sized and non-sized paper. Alum was added in increasing quantities in both cases at the beater.

"It can be seen that with both white waters, there was an optimum efficiency which, however, was not situated at the same *p*H value. The form of the curves which at the first moment seems surprising for the non-sized paper, becomes understandable if the curve is considered from right to left in the same manner in which it originated during the experiments. Starting from the white water which

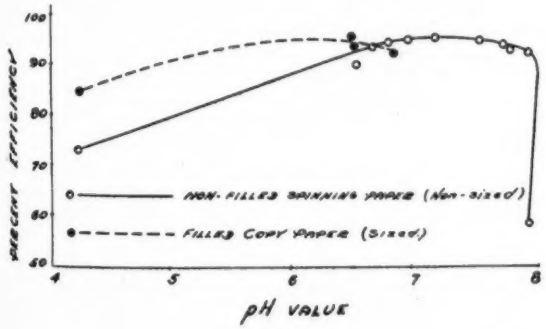

Fig. 3
Influence of pH.

Fig. 4
The influence of glue composition.

was practically free from aluminum sulphate (*p*H of 8.0) in the beater were added increased quantities of aluminum sulphate. The first addition which was a very small one, so that it did not even induce a visible change of the *p*H value, caused a remarkable increase of the flotation efficiency. There is no doubt that this was caused by the enormous electropositive potential of the aluminum sulphate, which of course has no relation to the *p*H value. The reason for our obtaining so quickly favorable outputs may be seen in the fact that the present non-sized long fibered paper pulp had little short material and the quantity of electrolyte introduced with the spray water was relatively large. Therefore it was sufficient to give a small addition of aluminum sulphate to guarantee the quantity of electrolyte which is necessary to obtain the optimum efficiency.

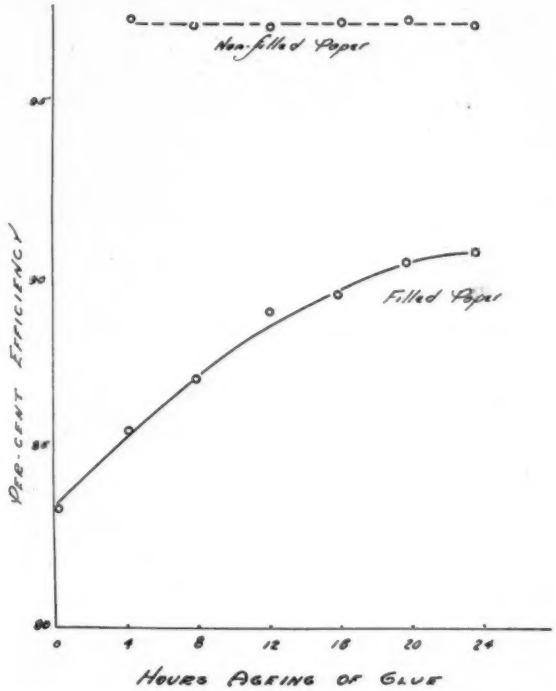

Fig. 5
Influence of the age of the glue

The situation was quite different with the white water of the sized paper. In this case there was a bigger manufacture, and the concentration was three times as high because of the shorter and filled material. In this case, the quantity of electrolyte derived from the spray water in relation to the quantity of dry material was so much smaller that the optimum output would be obtained only by the addition of a larger quantity of aluminum sulphate, and therefore, a lower *p*H value of the white water.

It is shown hereby that the *p*H value is not an absolutely valid point of judgement for the possibility of flotation of a white water.

2. Composition and Age of the Glue

In Fig. 4 it is shown that the efficiency of the save-all in connection with a heavily filled paper is dependent both upon the composition and age of the glue flocculating agent.

"First of all it is demonstrated that with all preparations, the age was of very considerable influence upon the efficiency and especially it is shown that the efficiencies obtained after an aging process of 24 hours were far higher than the outputs with fresh preparations. Furthermore, it can be seen that the differences in efficiency with the various preparations appeared to be of importance only with the fresh glues which had not been aged. As far as the aged glues are concerned, we have found that animal glue by itself causes only a mediocre result of foam. This result is increased when adding rosin, and even on all tests it has been found that a rosin and glue addition increased the foaming. By adding aluminum sulphate, but especially when adding formaldehyde, the foaming was reduced. The best results were obtained with animal glue and rosin milk and these were even superior to the results obtained with the Sveen preparations. It is to state, however, at this occasion, that the preserving influence of aluminum sulphate and formaldehyde is absolutely necessary, because it was observed that glue which remained longer than two days started to decompose."

Further experiments were carried out on the ageing of the glue and its effect on both filled and unfilled papers. The results are shown in Fig. 5.

"It seems that with the non-filled paper ageing of the glue has no importance, and the efficiencies were independent of the age of the glue. With the filled papers, however, the efficiency of the clarifying process increased considerably, parallel with the increasing age of the glue, although longer periods of ageing than 24 hours did not show better results."

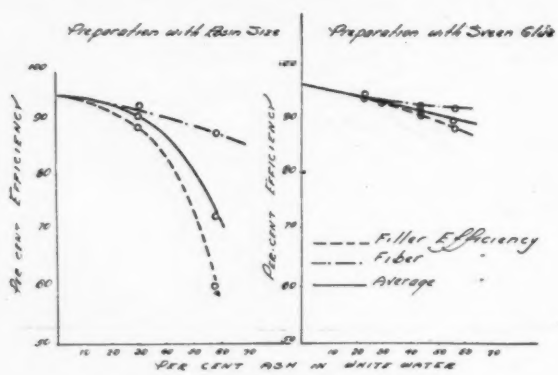

Fig. 6

The influence of different preparations on the ash content of the white water.

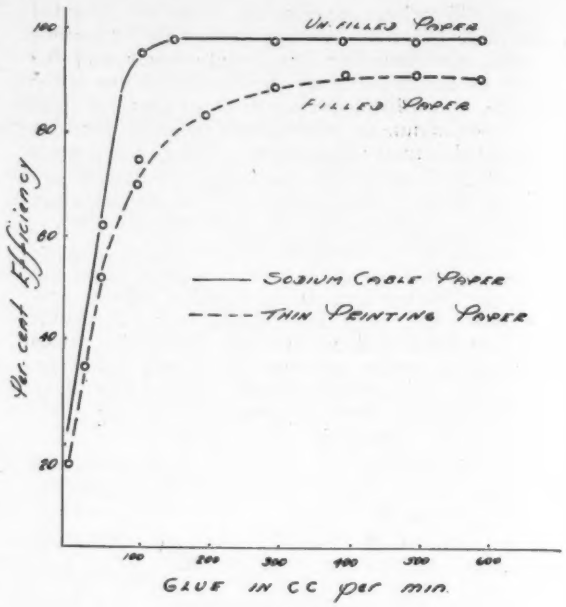

Fig. 7

The influence of the quantity of sveen glue

3. The Influence of Two Different Flocculating Agents on White Water Containing Filler

The flotation of filler in white water is of primary importance in a good many cases. Fig. 6 shows the efficiency of two different flocculating agents as the ash content of the white water is increased and indeed the efficiency of the filler and fiber separately as well as the total efficiency.

"The figure shows that the total efficiency as well as the efficiency of both the fiber and filler depends upon the ash content of the solid matter contained in the white water. The diagram on the right side concerns the treatment with the Sveen glue, and the diagram on the left side the treatment with rosin milk.

"In both cases, the efficiency is reduced when the ash content increases. There is, however, an enormous difference in the result or efficiency of the two preparations. As long as the ash content is a low one, the efficiency is reduced with the Sveen system, only in a slight measure, whenever the filler content increases. But even with high ash contents, the efficiency reduced only within moderate limits. Rosin milk, however, if added to the white water of filler content of more than 30 per cent (which would correspond to a filler content of the paper of about somewhat more than 8 per cent) causes heavy reductions.

"During our examinations, it became more and more clear, that good flotation with long fibered nonfilled material necessitates the presence of a strong foam producer, whereas with muddy, short and filled material, the flaking is more important. Consequently, for the first mentioned material, the rosin milk preparation has proved itself insuperable, whereas with the latter, the Sveen glue shows all its advantages."

4. The Quantity of Glue to be Added

In Fig. 7, the efficiency of the save-all in relation to the quantity of glue added is portrayed.

"With non-filled paper the efficiency curve rises with an increased addition of glue straight and steeply, but turns before the maximum value of efficiency. Later on it continues horizontally even with an increased addition of glue. The point is clearly indicated where an increased addition of glue does not create an increased efficiency.

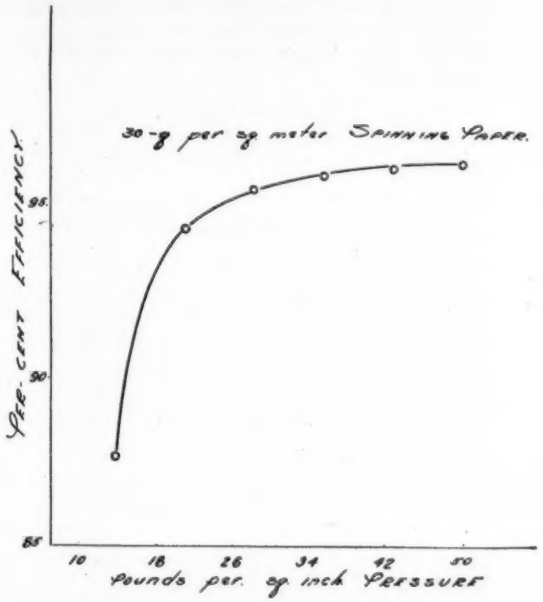

Fig. 8

The influence of air which is dissolved in the white water, the quantity of air being indicated by the pressure in the retention chamber.

"Even with the filled paper, the curve rises rapidly, but far earlier than in the previous case the curve flattens out. The maximum value is obtained with a quantity of glue four times as high as with non-filled paper."

5. The Pressure in the Retention Chamber

In Fig. 8 the efficiency in relation to the pressure of the retention chamber is shown.

"The curve starts at the pressure of 14.4 lb. per sq. in. with an efficiency value of 87 per cent, and at an increasing pressure it rises steeply in the beginning. It becomes more horizontal later on, and we can observe that higher pressures than 50 lb. per sq. in. don't cause any considerable increase in efficiency.

"This effect has to be explained by the fact that at a relatively low pressure the condition has already been reached where all the particles were already provided with the air bubbles necessary for their rising.

"Furthermore, there is a certain critical pressure above which an increase of pressure, and therefore, a higher energy would entail higher expenses than it would produce in increased output, and profit thereof. This point, of course, is always different depending upon the electricity cost and the quality of the regenerated material, and in our case was near 43 lb. per sq. in."

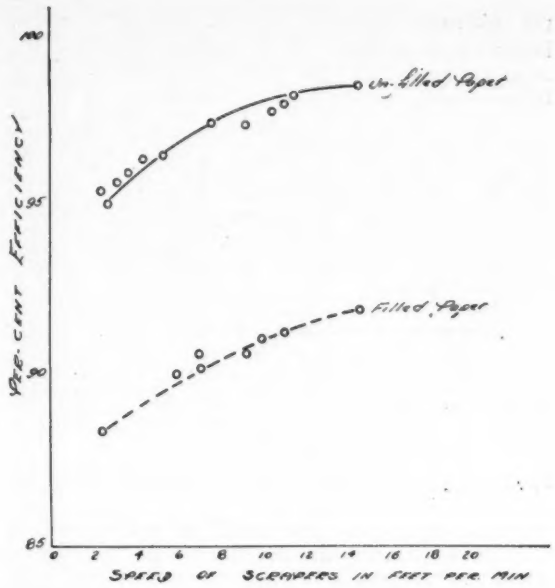

Fig. 9

The influence of the speed of the scrapers.

6. The Speed of the Scrapers

In Fig. 9 the speed of the scrapers in relation to

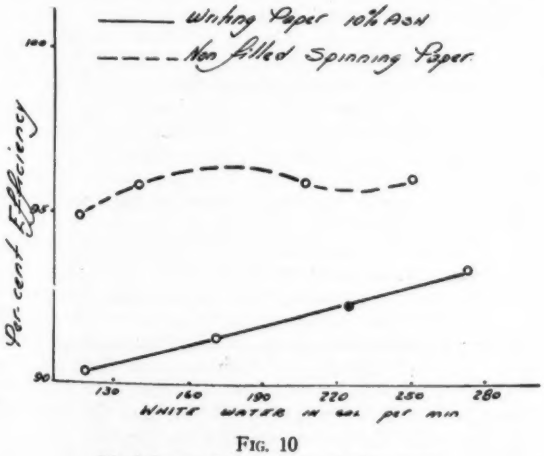

Fig. 10

The influence of the quantity of white water.

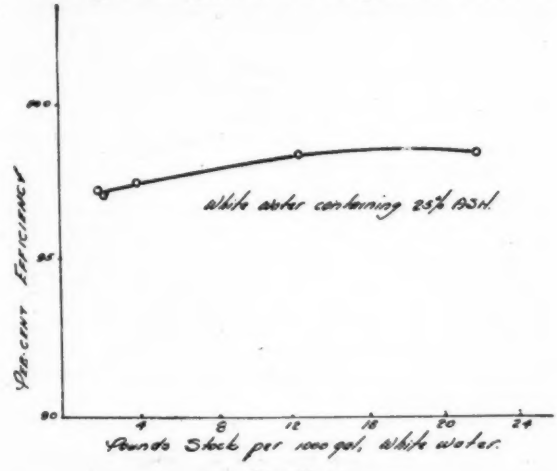

Fig. 11

The influence of the white water concentration.

the efficiency is shown. It was possible to obtain better results at from 10 to 15 feet per minute instead of the 2.3 feet per minute as recommended in the directions for use of the apparatus.

"The reason for these results was shown, when we took a sample from the inflow and examined the process of flotation in a glass cylinder. We could see that already a few minutes after the rising of the material, the particles had partially released their air bubbles and settled again. This can be avoided if the flotated particles are scraped off before that moment arrives.

"Because of technical reasons, it was not possible to increase the speed of the scrapers above 15 feet per minute. It has been observed, furthermore, that at such high speed a certain movement was produced in the vat. We are therefore compelled to suppose that a further increase of speed would probably cause a reduction of the efficiency values."

7. The Quantity of White Water In Gallons per Minute

In Fig. 10 the efficiency with both a filled and an unfilled paper is shown in relation to the quantity of white paper treated.

"It is an astonishing fact that the highest yield appeared with the highest passage of white water. Both curves rise slowly from the lowest charge to the highest. At a fluctuation in the white water supply of 50 per cent, however, the difference in yield was only 1.5 per cent for the non-filled paper and 3 per cent for the filled paper. These facts show that the efficiency of the save-all depends only in a slight degree upon the fluctuations in the waste water supply."

8. The Solid Content of the White Water

In Fig. 11 the efficiency is shown in relation to the solid content of the white water.

"A change from 0.21 pounds per 1000 gallons to 2.1 pounds per 1000 gallons corresponds with an increase of yield of 1 per cent. The save-all consequently proved to be insensitive even in the case of the greatest fluctuations in concentration which practically may arise."

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Operating Experiences with Forced Circulation and Indirect Heating in Sulphite Digesters*

By D. C. Porter[1]

Abstract

A review of practical operating problems encountered in the use of forced circulation and indirect heating in sulphite digesters. These problems include scale formation, in tubes, blowing digesters clean, steam consumption, temperature and pressure control. Some of the benefits of the forced circulation system are cited.

At the present time indirect cooking with forced circulation and chip packing is becoming a very pertinent subject for consideration by sulphite mill operators when pressed for increased production, decreased costs or better quality. Papers published in the past by W. H. Swanson et al. *(1)* and Lloyd Lang *(2)* have covered the technical and developmental phases of the subject within the Kimberly-Clark Corporation. This paper will be confined to the operating experiences we have had during the past seven years and recent refinements in operating procedure. It is hoped that this information will aid those operators who may be called on to work with this process without a background of considerable experience.

Scale in Piping and Heaters

The first difficulty that was encountered and which proved to be most baffling and annoying was the formation of scale in the circulating piping and tubular heaters. A thorough study of the problem finally indicated that the cause of the scale usually arises in the acid plant, either because of faulty equipment or poor operation and not because of any weakness in the circulating system itself.

The two types of scale formed are calcium sulphate and the monosulphite which is caused by a low ratio of free to combined sulphur dioxide in the cooking acid. The sulphate scale has been the more common form encountered at the Kimberly mill and it was caused by a high oxygen content in the gases supplied to the milk of lime acid system. The presence of oxygen in the gases produced and consumed in any acid plant may be caused by any one or a combination of more than one of the evils with which most acid plants seem to be blessed. First, the sulphur burning equipment may be of such design as to make it impossible to produce a gas with a high sulphur dioxide concentration and low oxygen content. Second, through oversight, some part of the acid plant equipment may be allowing the infiltration of air which naturally will increase the amount of oxygen in the gases supplied to the acid system. And third, the blow down schedule of the digesters

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.
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may be interfering with the operation of the sulphur burner.

At Kimberly, we have experienced all of the foregoing troubles and after considerable revamping of equipment, cleared up the difficulties. A new spray type sulphur burner was installed, giving a 19½ per cent sulphur dioxide instead of the 16½ per cent from the old burner. However, a spray type burner is not essential as we have found the operation of a rotary burner can be greatly improved by using a metering pump to supply molten sulphur to the rotating unit.

Also, an acid fortification tower, operating under a slight vacuum and allowing air to enter, was removed from the system. These steps took care of the excess oxygen problem caused by the burner and leaking equipment but did nothing towards removing the interference of the blow-down cycle to the burner operation nor did it improve the reclaimed acid strength.

In the conventional acid plant, the reclaimed gas is joined with the burner gas and the mixture passed into the acid system to produce the raw acid or the reclaimed gas is introduced directly into the weak tower. With either method of recovering relief gas, any variation in the rate of flow of the relief gas causes a fluctuation in the amount of air drawn into the burner and makes it impossible to produce a uniformly high strength burner gas. A series of tests made at Kimberly indicated that the variation in quantity of reclaimed gas was enough to cause a 10 per cent variation in the amount of air drawn into the burner and consequently the burner gas concentration was subject to wide variations.

A System Which Did Three Things

On the basis of these tests a counter-current independent recovery system was designed and installed which did three things. It separated relief gas from the burner gas, allowing the burner to operate as an independent feeder unit to supply the sulphur lost in the blow-pits, and increased the free sulphur dioxide in the mixture of reclaimed acid and hot liquor from 3.25 to 5.25 per cent at a temperature of 40 deg. C. and atmospheric pressure. It also decreased the oxygen in the gas to the acid system enough to halve the quantity of sulphate formed in the acid. This reduction in sulphate was enough to allow us to lengthen the time between heater cleanings from five weeks to three months.

Another rare cause of scale in the heaters which may be well to mention at this time is the reduction of the velocity of the liquor in the heater tubes below the recommended 8 feet per second, caused by excessive wear in the pump or the gradual accumulation of scale in the circulating piping to a point that it interferes with circulation rate. Under either of these conditions, the heaters will scale very rapidly. However, as this happens so very seldom, it may be considered of a minor nature.

Blowing Digesters Clean

During our experimenting with the chip packer, we uncovered another source of trouble, that of blowing digesters clean. A protracted study of this was completed and the conclusion drawn that if there is no inherent fault in the design of the digesters or blow piping, the amount of wood charged and the method of packing are the only factors effecting their blowing clean. In other words, if there had been no previous blowing troubles with normal chip filling, the proper use of a chip packer does not bring up new problems. We have found that the chips must be packed in horizontal layers from the bottom to the top of the digesters. If the chips are put in so as to give a concave contour to the rising chip surface, there will be tight packing at the circumference of the digester, loose packing at the center and a strong tendency for a portion of the stock to remain in the digester after blowing. On the other hand, if there is a convex rising chip surface, the production per cook will not be as high as it should be. At the same time, it has developed that increasing the production per cook more than 30 per cent above that possible in a direct cook with normal chip filling will not result in a clean blow.

In the operation of a circulating system, which has been supplied with acid of a low sulphate content and a high ratio of free to combined sulphur dioxide, we have found that the time of cooking and the pressure schedule may be held constant and a uniform pulp produced by varying the maximum temperature to compensate for variations in the amount of free sulphur dioxide in the cooking acid. To put it in another way, the digesters are cooked to time and temperature alone. A typical example is as follows: If the cooking time is set at ten hours, the time to maximum temperature four hours, the time to fill with chips forty-five minutes, the digester is pumped to overflowing with acid, a set pressure schedule followed, the only variation in procedure from cook to cook is in the maximum temperature used. When cooking spruce under the above conditions, the maximum temperature is 140 deg. C. if the free sulphur dioxide in the acid is 3.30 per cent and 133 deg. C. if the free is 5.10 per cent. This procedure is followed regardless of how much the spruce density or moisture content may vary. We have assumed that a high strength acid will tend to minimize the effect of variations in wood density and moisture and the results of actual practice have borne out this assumption.

Screenings and Steam Consumption

The time of rise to maximum temperature has been found to be very important as far as pulp screenings and steam consumption are concerned. Should the temperature be brought to maximum in less than 3½ hours, a low maximum temperature, with low steam consumption, can be used but there will be a high percentage of rejections. The optimum time to maximum temperature appears to be 3¾ to 4 hours as at that point the rejections are kept at a minimum with a reasonable quantity of steam being used. If the time to maximum is extended to 5 hours or more, there will be an increase in steam used with no proportionate reduction in rejections.

The rate of temperature rise is also important in that there should be no sudden acceleration when near maximum. A speeding up of the temperature rise when near the maximum invariably results in a high percentage of rejected pulp.

Semi-Automatic Temperature Controller

For a number of years, we used a semi-automatic temperature controller and found it to be a marked improvement over manual control but still did not give the control needed to produce a uniform pulp cook after cook. These instruments did very well on holding the digester temperature constant at max-

imum but could not be set for the maximum until just before that point in the cooking cycle had been reached. Consequently, quite a number of cooks had a sudden rise in temperature just before maximum was reached, a condition we were trying to avoid.

Our experience with these instruments produced the firm conviction that to gain and maintain the desired uniformity from cook to cook, new and better instruments would have to be used. In conjunction with some of the instrument manufacturers, new time-cycle temperature controllers were developed and tried on our digesters.

Pressure Control

At the same time that the importance of exact duplication of temperature schedule was recognized, it also became apparent that instrument control on the pressure schedule was needed. We found that manual control left too much to the judgment of the operators and we did not get the recovery of relief gas wanted nor was the relief gas properly proportioned to the recovery process to keep a uniform strength in the reclaimed acid.

At the start of our work with the circulating systems, the practice was to build the digester pressure up to 85 pounds and hold it there until 2½ hours before the end of the cook. The steam to the heaters was shut off at that point, the pressure reduced to 30 pounds and the digester blown. We found that this method not only did not recover all the sulphur that is recoverable but it also caused surges of gas through the recovery system with a resulting non-uniformity in the acid strength. About two years ago the procedure was changed and the pressure reduction was started four hours before the end of the cook. The pressure is reduced to as low a point as the resistance of the recovery system will allow, about 12 pounds, and then built up to 30 pounds with direct steam for blowing. Although this increases the steam consumption slightly, the added cost of the steam is returned three-fold in the sulphur saved.

Another change in the pressure schedule has been made between the time the digester reaches maximum temperature and a point four hours before the end of the cook. Instead of holding the pressure constant at 85 pounds with a smooth controller cam, the controller cam was cut so as to reduce the pressure 5 pounds in a five minute period and then return the pressure to 85 pounds during the next ten minutes. This pressure cycling is repeated continuously from the fourth hour of the cook until the blow-down starts and has allowed us to recover an additional ten pounds of sulphur per ton of pulp.

Although the above described pressure schedule has done a lot towards getting the proper proportioning of the relief gas to the raw acid in the recovery system we plan another step which should bring us still nearer perfection. During the next year, we expect to install a proportioning controller to give an exact control over the ratio of raw acid to relief gas and obtain the uniformity of acid strength we think is necessary.

A Peculiarity of Circulating Systems

One peculiarity of the circulating systems, which every operator of them has encountered, is the dropping off of the power input to the circulating pump motor during the blow-down period of the cook, indicating a lowering of the liquor circulating rate. This condition is quite definitely linked with the rapid removal of sulphur dioxide from the digester and at the present time we are experimenting with a new type pressure schedule which promises to aid us in maintaining full circulation rate to the end of the cook. This should enable us to recover still more sulphur from the digesters. As soon as this study is completed, the information will be made available to the industry.

Benefits of the Forced Circulation System

After seven years of operation, it is possible for us to look back and get a clear picture of the added maintenance costs because of the additional equipment. The cost has been $0.13 per ton of pulp produced. The figure given includes, reconditioning of pumps after six years of operation, cleaning of heaters, retubing heaters at three year intervals and the replacement of some of the larger chrome-nickel-iron piping during the seventh year of operation.

The piping that was replaced did not wear thin throughout its length but failed because of pitting under scale deposits so we had another incentive to prevent the formation of scale. An analysis of the scale showed the presence of copper in considerable amounts so the conclusion drawn was that this was a case of electrolytic corrosion, the copper coming from bronze digester fittings that had not been replaced with acid resisting alloy steel.

During this same seven-year period we have also gotten a clear picture of what the economic gains over direct cooking have been. Production has been increased from 92 tons per day with 9½ hour cooking to 114 tons per day with 9¾ hour cooking, because the production per cook has increased from 7.2 to 9.2 tons.

Sulphur has been reduced from 290 pounds per ton of pulp to 220 pounds and lime from 165 pounds to 143 pounds per ton. Because of the lower cooking temperature in use now and the credit obtained for return of condensate from the heaters to the steam plant, steam consumption has dropped from 5400 to 4200 pounds per ton of pulp. There has also been an 8 per cent increase in the yield of pulp per unit of wood.

Costs Decreased and Quality Improved

At the same time that production costs have been decreased, quality has been improved. Pop and fold have been increased 12 per cent over the strength of direct cooked pulp and the uniformity has been infinitely better. In the direct cooks, the variation in chlorine requirement for bleaching varied as high as 100 per cent from cook to cook whereas with the circulated cooks the chlorine requirement does not vary more than a plus or minus 6 per cent from the average.

Cooks Under Control Should Not Vary

The fact has been established that the cooking time of circulated cooks must be kept constant and temperature and pressure schedules accurately controlled. Inasmuch as sulphite cooking is a science, it is logical, that with these conditions under control, the pulp produced will not differ, one cook from the next.

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Beating

Performance of the New Types of Hollander Beaters. P. V. Shumilov and M. A. Morshchikhina. Tzentral, Nauch.-Issledovatel. Inst. Bumazh. Prom. Materialy 1937, No. 25:116-126; C. A. 32: 8134.—The performance of Foyt, Mallikh and Banning hollanders of new construction was compared in beating unbleached sulphite pulp to 18-20 degs. freeness and bleached sulphite pulp to 40-45 degs. freeness for the production of writing and printing paper No. 3 and Nos. 1 and 2, respectively. The best results were obtained in the Banning beater at a minimum pulp concentration of 7.5 per cent and specific drum pressure of five kg. per square meter for bleached pulp and 2.5 kg. per square meter for unbleached pulp.—C.J.W.

Beater Installation. Wochbl. Papierfabr. 69, no. 19:411; no. 22:473; no. 23:492; no. 26:553 (May 7, 28, June 4, 25, 1938); B. I. P. C. 9:20.—The manufacturer of tarred and other wrapping papers (80-400 g./sq. m.), at the rate of about 15 tons per 24 hours, intends to replace his 4 small beaters by two larger ones with a capacity of 500-600 kg. each. He asks for the most suitable construction; the space available is 5x12 m. Most answers suggest not too large beaters for this type of paper, a capacity of 300-350 kg. being sufficient for the production of 15 tons per 24 hours. Various types of beaters are listed such as Mallickh, Banning, etc. Some recommend the installation of one breaker beater; one answer suggests equipping the present beaters with the patented Schmidt tackle.—C.J.W.

New Knoves for Whole Stuff Beaters. Wochbl. Papierfabr. 69, no. 18:387; no. 22:472-473 (April 30, May 28, 1938); B. I. P. C. 9:21.—The inquirer has to replace the knives on the rolls and bedplates of some of his beaters (capacity 3000 liters) used for beating cotton and some chemical pulp at a consistency of 3-5 per cent. In general a free pulp is required, varying between 15-40 degs. S.R.; unsized papers and boards of 50-600 g. per sq. m. are made from it. He asks for the most suitable width of the knives for these conditions, and whether the same size of bars is recommended for both bedplate and roll. One answer points out that the differences demanded for these conditions are too great to recomend a generally suitable size; a compromise will have to be made. Free pulps require narrow knives, slow pulps wide ones; the general practice is to have the roll knives 2-5 mm. wider than the bedplate bars. The roll knives are usually installed parallel to the axis of the roll; the bedplate knives at an angle of 7-12 degs., depending on the desired degree of beating. The best suggestions, without doubt, can be made by the manufacturers of beaters who have a wide experience with the most varied conditions.—C.J.W.

Beating. I. The relation between the degree of beating of a paper pulp and the electrolyte concentration of the water. K. Kanamaru. Kolloid-Z. 84, no. 2:222-232 (Aug., 1938); B. I. P. C. 9:56.—Pulp beaten in the presence of hydrochloric acid, sodium hydroxide, potassium chloride, and aluminum chloride of varying concentrations and of buffer mixtures of various pH values is hydrated in accordance with a previously reputed relation between the degree of swelling and the zeta potential on the fibers. The pH values are shown to be a determining factor, and maxima in the swelling curves and in the degree of beating (time of drainage of water from pulp) are shown at pH 5-6 and 8-9, with a minimum at 7.0-7.5. —C.J.W.

Beater Room Control. W. H. Hoffman. Tech. Assoc. Papers 21:177-180 (June, 1938); Paper Trade J. 107, No. 10:36-39 (Sept. 8, 1938).—A discussion of beater room control from the viewpoint of the technical man in the mill.—A.P.-C.

The Hydrafiner for Beating. J. D. Haskel. Pulp Paper Mag. Can. 39:680-681 (Sept., 1938).—A description of the salient design features of the hydrafiner and methods of its application.—A.P.-C.

Evaluating Beating Equipment Efficiency. H. D. Cook. Paper Ind. 20:42-413 (July, 1938).—A plea for the technical leaders of the paper industry to evolve and establish some workable means of evaluating the efficiency of beating equipment.—A.P.-C.

The Thorsen-Herby Beater. Edouard Héry. Papier 41:469-480 (June, 1938).—A general discussion of the performance of this beater from the two-fold standpoint of quality of the beaten fibers and power consumption.—A.P.-C.

Hydraulic Beating Apparatus. Richard D. Kehoe, assignor to Paper and Industrial Appliances, Inc., U. S. pat. 2,125,298 (Aug. 2, 1938).—Pulp is pumped from the stuff chest to the flow box, being discharged under high pressure, through a pair of oppositely mounted nozzles, into a casing above the stuff box provided with pairs of angle plates mounted in pairs at right angles to each other and grouped about a hollow rectangle in the center of the casing. Opposite pairs of baffles are identical, one set of these opposite pairs comprising metallic bars projecting from the face of the baffles, and the other set comprising basalt lava stones of the character employed in jordans or their equivalent. One of the groups of plates (preferably the one having the bars) has those plates which define the rectangle formed with apertures opposite each other. Remotely controlled means are provided for rotating the baffles as required in order to obtain the type of hydration required, either against the metallic or lava plates, or of the two jets impinging on each other through the apertures in the metal plates. (Cl. 92-20)—A.P.-C.

Refining Engine. Wm. V. Knoll, assignor to Mid-West-Fulton Machine Co. U. S. pat. 2,126,264 (Aug. 9, 1938).—The invention provides a modification in the construction of the nozzle provided for delivering stock to the refining engine disclosed in Knoll's U. S. pat. 2,061,662, of Nov. 24, 1936. The vertical dimension of the nozzle is made somewhat greater and the opening is then divided by a series of tapering partitions, thereby dividing the main nozzle, near its end, into a series of separate openings, the combined width of which is somewhat less than one half the width of the roll. This structure considerably increases the discharge velocity of the pulp. (Cl. 92-24)—A.P.-C.

Beater. Charles R. Seaborne. U. S. pat. 2,129,789 (Sept. 13, 1938).—The invention provides vari-

ous improvements in mechanical features of beaters of the general type disclosed in Seaborne's U. S. pat. 1,691,308, of Nov. 13, 1928, the modifications being intended to permit sustained operation over long periods without clogging the knives and to effect a more positive and more rapid circulation. (Cl. 92-25)—A.P.-C.

Apparatus for Continuously Beating Paper Pulp. Ralph J. Serpas. U. S. pat. 2,125,820 (Aug. 2, 1938).—The apparatus comprises a casing having a series of adjacent compartments. In each compartment is mounted a beater roll with co-acting bed plate, the rolls in the several compartments being mounted on a common shaft. The pulp is passed continuously and successively through the several compartments. (Cl. 92-25)—A.P.-C.

Machine for Use in the Preparation of Paper Stock. Anton J. Haug. U. S. pat. 2,133,449 (Oct. 19, 1938).—The invention provides various improvements in the refiner disclosed in Haug's U. S. pat. 2,066,107, of Dec. 29, 1936, designed to improve its efficiency and broaden the range of material which it is capable of handling. More particularly, the inside wall of the drum or casing and the surface of the rolls are provided with grooves crossing diagonally to form a lozenge-shaped pattern, the depth of the grooves decreasing from the inlet end to the outlet end. Metal bushings are replaced by indurated fiber, Micarta, etc., bushings, which can be lubricated with water. (Cl. 92-26)—A.P.-C.

Sizing

Use of Paraffin in the Sizing of Lithographic Paper. N. D. Pankovets and N. A. Liskovich. Bumazhnaya Prom. 16, no. 3:13-19 (1938); C. A. 32:7261.—The combined experimental results show than an economy of 40-50 per cent of rosin and a considerable decrease in the deformation of paper can be effected by sizing of paper (100 per cent bleached sulphite pulp) with alkaline paraffin-resinate emulsions as compared with the use of the common white size. The addition of about 2.5 per cent of animal glue (based on the rosin) improves the mechanical properties of paper. The size can be used successfully in sizing of lithographic and offset papers and is not suited for the manufacture of hard, stiff and resonant stock. Tentative laboratory and factory procedures for the preparation and application of the emulsion sizes are discussed.—C.J.W.

The Sizing of Paper. S. Samuelsen. Papir-J. 26, no. 15:183-186; no. 16:196-200 (Aug. 20, 31, 1938); Finnish Paper and Timber J. 20, no. 15A: 12-14, 16-18, 20-21 (Aug. 15-16, 1938); B. I. P. C. 9:73-74.—In the present article studies of the influence of water on sizing results are described. In order to obtain comparable values 1.5 per cent Delthirna size, 2.25 per cent alum, and a bleached sulphite pulp beaten to 40 deg. S.R. were used for all experiments. Size resistance was not found to increase in ratio to the amount of size added. A maximum is reached at approximately 2.5 per cent; after this, practically no change occurs. The effect of distilled water, ice water, ordinary tap water, mill water from three different plants, a ground water pumped up from a 50 m. deep boring in a granite bed, and of a bog water on sizing was studied. The different water samples showed a great variety in composition. The poorest sizing resistance was obtained with distilled water and ice water, whether Delthirna or Bewoid size was used. When ordinary water was frozen and remelted a considerable drop in sizing degree was noticed, whereas no change occurred when distilled water was thus treated and employed. In order to determine the maximum effect of ice water on sizing degree, such water was added at various stages of the sizing procedure; the greatest drop resulted when ice water was used throughout, exerting an influence even after the size was fixed upon the fibers. Analysis of ordinary tap water before and after freezing showed that the remelted water is much purer. The change in the effect on sizing is apparently not caused by inorganic compounds, but is due to the rearrangement of certain organic compounds whose composition and characteristics are as yet unknown. The influence of varying degrees of hardness of the water on sizing was found to be slight: Bewoid sizing was not effected at all. Sulphate pulp is much easier to size than sulfite, and only half the amount of rosin is needed for identical results. When sulphate waste liquor or bleach waste liquor from sulphate pulp is added to ice water, the sizing effect is considerably improved. Although no definite conclusions can yet be drawn, the theory is advanced that in sulphate waste liquor the organic compound may be present in those forms which exerts a favorable influence on the sizing degree. The studies are being continued.—C.J.W.

The Present Position of Sizing of Paper. Hans Hentschel. Wochbl. Papierfabr. 69, No. 28:589-92 (July 9, 1938).—In 1934 Germany imported practicaly all the rosin used for sizing paper but in the past years increasing amounts of German-made rosin is being used. Rosin was first used as size in 1807 by Illig in Darmstadt, and he believed that the sizing was caused by the free rosin itself, and from that time on there has been constant discussion as to the actual sizing agent. The Bewoid and the Gillet processes for sizing are briefly described. The use of montan wax sizing and its advantages over rosin sizing are given. Other sizing materials such as water glass and starch and sizing by means of impregnation are discussed. In conclusion the author mentions the testing of sizing.—J.F.O.

Size for Paper. Robert F. Ruthruff, assignor to Standard Oil Company of Indiana. Can. pat. 373, 841 (May 17, 1938).—Paper is sized and coated with a resinous plastic polymer of butylene or isobutylene dissolved in a volatile solvent. Several examples are described.—A.P.-C.

Starch Sizing of Paper. Ben W. Rowland and Jordan V. Bauer, assignors to Stein, Hall Manufacturing Company U. S. 2,113,034 (April 5, 1938).—There is introduced into the furnish, before the completion of the beating operation, an alkaline dispersion of a tough starch produced by treating a raw starch with formaldehyde and an acid catalyst such as hydrochloric acid, and, prior to the paper making operation, sufficient acidic material is added to the furnish to precipitate the starch upon the fiber in finely divided form. (Cl. 92-21)—A.P.-C.

Method of Producing Sized Papers. Francis G. Rawling, assignor to West Virginia Pulp and Paper Company. U. S. pat. 2,114,809 (April 19, 1938).—In the production of filled and sized paper, stock at a *p*H of not over 7.0 is mixed in a closed vessel with a filler containing calcium carbonate and sizing ingredients including alum; the carbinate and alum are permitted to react to a limited extent to produce carbon dioxide, and escape of substantial amounts of the carbon dioxide so generated is prevented so as to maintain the mixture at a *p*H value of not more than 7.0 (Cl. 92-21)—A.P.-C.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS
WEEK ENDING AUGUST 12, 1939
SUMMARY

Cigarette paper ..... 722 cs.
Wall paper ..... 2 cs.
Wall board ..... 277 bdls.
Paper hangings ..... 2 cs., 4 bls.
Newsprint ..... 9057 rolls
Printing paper ..... 3 rolls, 58 cs.
Wrapping paper ..... 666 pkgs., 2,231 rolls, 1,428 bls., 14 cs.
Kraft paper ..... 206 rolls, 50 bls.
Drawing paper ..... 46 cs.
Filter paper ..... 10 cs.
Tracing cloth ..... 29 cs.
Surface coated paper ..... 26 cs.
Surface baryta coated paper ..... 13 cs.
Marble paper ..... 6 cs.
Paper backed tinfoil ..... 18 cs.
Photo paper ..... 5 cs.
Decalcomanias ..... 24 cs.
Painting paper ..... 5 bls., 2 cs.
Writing paper ..... 16 cs.
Raw paper ..... 3 cs.
Paper tubes ..... 90 ctns., 42 cs.
Paper boards ..... 125 bls.
Miscellaneous paper .... 319 pkgs., 3,015 rolls, 260 bls., 159 cs.

CIGARETTE PAPER
De Mauduit Paper Corp., *Ile de France,* Havre, 2 cs.
Champagne Paper Corp., *Caraibe,* Havre, 720 cs.

WALL PAPER
———, *Bremen,* Bremen, 2 cs.

WALL BOARD
A. H. Morner, *Temnaren,* Gothenburg, 192 bdls.
A H. Morner, *Kungsholm,* Gothenburg, 85 bdls.

PAPER HANGINGS
W. H. S. Lloyd & Co., *American Banker,* London, 4 bls., 2 cs.

NEWSPRINT
Pagel Horton & Co., Inc., *Bergensfjord,* Skien, 751 rolls.
———, *Bergensfjord,* Oslo, 280 rolls.
International Paper Co., *G.T.D.,* Gatineau, 285 rolls.
H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 334 rolls.
N. Y. Evening Journal, *Markland,* Liverpool, N.S., 734 rolls.
N. Y. Tribune, *Markland,* Liverpool, N.S., 1,163 rolls.
Brooklyn Daily Eagle, *Markland,* Liverpool, N.S., 581 rolls.
World Telegram, *Markland,* Liverpool, N.S., 586 rolls.
Herald Statesman, Inc., *Markland,* Liverpool, N.S., 42 rolls.
H. G. Craig Co., Inc., *Donpaco,* Donnacona, 327 rolls.
Jay Madden Corp., *Deutschland,* Finland, 494 rolls.
H. G. Craig Co., Inc., *A.C.D.,* Donnacona, 383 rolls.
Perkins Goodwin & Co., *Kungsholm,* Gothenburg, 169 rolls.
H. Reeve Angel & Co., Inc., *Astrid Thorden,* Kotka, 453 rolls.
Nolan Bowmall & Co., Inc., *Temnaren,* Gothenburg, 120 rolls.
———, *Temnaren,* Hallstavik, 602 rolls.
Lunham & Reeve, Inc., *Temnaren,* Kotka, 136 rolls.
Jay Madden Corp., *Temnaren,* Kotka, 935 rolls.
International Paper Co., *Kermic,* Gatineau, 374 rolls.
International Paper Co., *International #1,* Gatineau, 308 rolls.

PRINTING PAPER
Steiner Paper Corp., *Bilderdyk,* Rotterdam, 4 cs.
Keuffel & Esser Co., *Deutschland,* Hamburg, 3 rolls.
E. Deitzgen & Co., *Deutschland,* Hamburg, 54 cs.

WRAPPING PAPER
H. Reeve Angel & Co., Inc., *Black Heron,* Antwerp, 3 cs.
Jay Madden Corp., *Astrid Thorden,* Rauma, 1,060 rolls, 1,002 bls., 666 pkgs.
Jay Madden Corp., *Astrid Thorden,* Viipuri, 83 rolls.
———, *Tampa,* Drammen, 6 bls.
———, *Kungsholm,* Gothenburg, 1,079 rolls, 409 bls.
Blauvelt Wiley Paper Manfg. Co., *Kungsholm,* Gothenburg, 9 rolls, 11 bls.
———, *Deutschland,* Hamburg, 11 cs.

KRAFT PAPER
Lincoln Import Specialties Corp., *Temnaren,* Gothenburg, 206 rolls.
American Trading Co., Inc., *Kungsholm,* Gothenburg, 50 bls.

DRAWING PAPER
George Haas, *American Banker,* London, 3 cs.
H. Reeve Angel & Co., Inc., *American Banker,* London, 7 cs.
Stevens & Nelson Paper Corp., *American Banker,* London, 1 cs.
Keuffel & Esser Co., *Deutschland,* Hamburg, 35 cs.

FILTER PAPER
H. Reeve Angel & Co., Inc., *American Banker,* London, 6 cs.
G. F. Doherty, Co., *Ile de France,* Havre, 3 cs.
———, *Deutschland,* Hamburg, 1 cs.

TRACING CLOTH
E. Dietzgen & Co., *American Importer,* Manchester, 15 cs.
Keuffel & Esser Co., *American Importer,* Manchester, 14 cs.

SURFACE COATED PAPER
Gevaert Co., of America, *Black Heron,* Antwerp, 26 cs.

SURFACE BARYTA COATED PAPER
Dingelstedt & Co., *Bilderdyk,* Rotterdam, 13 cs.

MARBLE PAPER
Borden Riley Paper Co., *Bilderdyk,* Antwerp, 6 cs.

PAPER BACKED TINFOIL
———, *Queen Mary,* Southampton, 18 cs.

PHOTO PAPER
J. J. Gavin Co., *Queen Mary,* Southampton, 5 cs.

DECALCOMANIAS
General Motors Overseas Operations, *Bremen,* Bremen, 24 cs.

PAINTING PAPER
Pitt & Scott, *Ile de France,* Havre, 5 bls., 2 cs.

WRITING PAPER
H. W. Robinson Co., *Il de France,* Havre, 11 cs.
Globe Shipping Co., *American Banker,* London, 5 cs., (& envelopes).

RAW PAPER
Ozalid Corp., *N. Amsterdam,* Rotterdam, 3 cs.

PAPER TUBES
———, *Bremen,* Bremen, 90 ctns., 42 cs.

PAPER BOARDS
Miller Paper Co., *Temnaren,* Gothenburg, 125 bls.

MISCELLANEOUS PAPER
Remington, Rand, Inc., *Kimikawa Maru,* Kobe, 33 cs.
H. Reeve Angel & Co., Inc., *Kimikawa Maru,* Yokohama, 11 cs.
Hildur Swanson, *Temnaren,* Gothenburg, 1 ble.
Consolidated Paper Co., *Temnaren,* Gothenburg, 1,948 rolls, 7 bls.
Walker Goulard Plehn Co., Inc., *Temnaren,* Gothenburg, 234 rolls.
Steiner Paper Corp., *Bilderdyk,* Antwerp, 6 cs.
F. L. Kramer & Co., *Kungsholm,* Gothenburg, 192 bls.
The Borregaard Co., Inc., *Kungsholm,* Gothenburg, 319 pkgs., 60 bls., 833 rolls.
Japan Paper Co., *Peter Maersk,* Kobe, 96 cs.
Remington, Rand, Inc., *Peter Maersk,* Kobe, 1 cs.
Keuffel & Esser Co., *Deutschland,* Hamburg, 12 cs.

RAGS, BAGGINGS, ETC.
———, *Black Heron,* Antwerp, 4 bls. rags.
C. Comiter, Co., *Nako Maru,* Shanghai, 233 bls. cotton waste.
J. Cohen & Son Co., Inc., *Samaria,* Liverpool, 18 bls. paper stock.
———, *Samaria,* Liverpool, 40 bls. rags.
———, *American Importer,* Manchester, 26 bls. rags.
———, *Caraibe,* Havre, 96 bls. cotton waste.
W. Steck & Co., *Excalibur,* Alexandria, 58 bls. bagging.
———, *Excalibur,* Alexandria, 8 bls. rags.
Spaulding Fibre Co., *Black Tern,* Rotterdam, 203 bls. rags.
B. D. Kaplan Co., Inc., *Donald McKay,* Copenhagen, 3 bls. rags.
Eagle Sack & Trading Co., *Donald McKay,* Copenhagen, 75 bls. bagging.
R. & V. Miller, Inc., *Bilderdyk,* Rotterdam, 10 bls. rags.
Royal Manfg. Co., *Mercier,* Antwerp, 291 bls. cotton waste.
———, *Mercier,* Antwerp, 5 bls. rags.
F. J. Fawcett, *Mercier,* Antwerp, 4 bls. flax waste.
———, *Gudrun Maersk,* Alexandria, 156 bls. bagging.

WOOD PULP

Gottesman & Co., Inc., *Temnaren,* Gothenburg, 450 bls. dry sulphate.
Castle & Overton, Inc., *Vigilant,* Gdynia, 450 bls. wood pulp, 45 tons.
Castle & Overton, Inc., *Temnaren,* Viborg, 810 bls. wood pulp.
Pulp Sales Corp., *Donald McKay,* Helsingfors, 1,050 bls. sulphite, 199 tons.
Atterbury Bros., Inc., *Tampa,* Tofte, 720 bls. bleached sulphite.
E. M. Sergeant Pulp & Chemical Co., *Bergensfjord,* Nygard, 125 bls. chemical pulp.
———, *Bergensfjord,* Sarpsborg, 600 bls. bleached sulphite.
The Borregaard Co., Inc., *Bergensfjord,* Sarpsborg, 504 bls. unbleached sulphate.
Irving Trust Co., *Bergensfjord,* Oslo, 200 bls. chemical pulp.
Gottesman & Co., Inc., *Touraine,* Sweden, 4,740 bls. wood pulp.

WOOD PULP BOARDS

Jay Madden Corp., *Astrid Thorden,* Kotka, 79 bls., 99 rolls.
Jay Madden Corp., *Astrid Thorden,* Viipuri, 15 bls.
H. Fuchs & Son, *Temnaren,* Gothenburg, 5 crates.
Fibre Case & Novelty Co., Inc., *Temnaren,* Gothenburg, 17 bls.
Salwen Paper Co., *Temnaren,* Gothenburg, 63 bls.
Jay Madden Corp., *Donald McKay,* Kotka, 10 bls.

NEWARK IMPORTS

WEEK ENDING AUGUST 12, 1939

Pulp Sales Corp., *Korsholm,* Kemi, 3,950 bls. sulphate, 659 tons.
Pagel Horton & Co., Inc., *Svaneholm,* Gefle, 250 bls. dry sulphite, 2,250 bls. dry sulphate.
Pulp Sales Corp., *Svaneholm,* Viipuri, 3,500 bls. wet sulphite.
Bulkley Dunton Pulp Co., Inc., *Svaneholm,* ———, 2,500 bls. sulphate.
Pulp Sales Corp., *Ingrid Thorden,* Kemi, 9,630 bls. sulphate.

ALBANY IMPORTS

WEEK ENDING AUGUST 12, 1939

Pulp Sales Corp., *Astrid Thorden,* Rauma, 520 bls. mechanically ground pulp, 1,430 bls. bleached sulphite, 622 bls. sulphite.
Pulp Sales Corp., *Astrid Thorden,* Kotka, 169 bls. bleached sulphite, 670 bls. sulphite, 638 bls. bleached sulphate.
Castle & Overton, Inc., *Astrid Thorden,* Viipuri, 518 bls. wood pulp.
Pulp Sales Corp., *Astrid Thorden,* Viipuri, 1,594 bls. sulphite, 4,746 bls. sulphate.
Pulp Sales Corp., *Ingrid Thorden,* Kemi, 1,745 bls. sulphate.
The Borregaard Co., Inc., *Tampa,* Oslo, 150 bls. unbleached sulphite, 500 bls. bleached wood pulp.
Atterbury Bros., Inc., *Tampa,* Drammen, 2,500 bls. chemical pulp.
Atterbury Bros., Inc., *Tampa,* Tofte, 2,302 bls. bleached sulphite.
The Borregaard Co., Inc., *Tampa,* Hurum, 150 bls. unbleached sulphate.
The Borregaard Co., Inc., *Tampa,* Greaker, 660 bls. bleached sulphite.
Price & Pierce, Ltd., *Tampa,* Greaker, 500 bls. bleached sulphite.
Price & Pierce, Ltd., *Braheholm,* ———, 250 bls. unbleached mechanical pulp, 900 bls. unbleached sulphate.
Price & Pierce, Ltd., *Touraine,* ———, 600 bls. bleached sulphite, 30 bls. bleached sulphate, 300 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Touraine,* Sweden, 8,414 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING AUGUST 12, 1939

———, *Black Heron,* Rotterdam, 46 coils old rope.
Darmstadt Scott & Courtney, *Black Heron,* Rotterdam, 12 bls. bag scrap.
Chemical Bank Trust Co., *Black Heron,* Rotterdam, 35 bls. rags.
T. D. Downing & Co., *Black Heron,* Rotterdam, 2 bls. rags.
Irving Trust Co., *Black Heron,* Antwerp, 55 bls. bagging.
C. Kutz, *Bilderdyk,* Rotterdam, 27 bls. picker waste.
Parsons & Whittemore, Inc., *Tampa,* ———, 375 bls. wood pulp.
Price & Pierce, Ltd., *Svaneholm,* ———, 370 bls. bleached sulphite.
Pagel Horton & Co., Inc., *Touraine,* Sweden, 806 bls. wood pulp.
Pagel Horton & Co., Inc., *Svaneholm,* Sweden, 500 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 12, 1939

Gottesman & Co., Inc., *Tampa,* Greaker, 1,200 bls. bleached wood pulp.
Nolan Bowmall & Co., Inc., *Temnaren,* Gothenburg, 71 rolls newsprint.
Parsons & Whittemore, Inc., *Temnaren,* Gothenburg, 74 rolls newsprint.
F. Weber Co., *Temnaren,* Gothenburg, 191 rolls paper.
Paper House of Penna., *Temnaren,* Gothenburg, 14 bls., 4 cs. paper.
J. W. Hampton Jr., & Co., *Temnaren,* Kotka, 319 rolls newsprint.
Pulp Sales Corp., *Temnaren,* Kotka, 210 bls. bleached sulphite.
E. J. Keller Co., Inc., *Donald McKay,* ———, 91 bls. rags.
Jay Madden Corp., *Donald McKay,* Kotka, 404 rolls newsprint.
William Bros., Co., Inc., *Tampa,* Stavanger, 40 rolls newsprint.
Pagel Horton & Co., Inc., *Tampa,* Oslo, 33 rolls newsprint.
American Trading Co., Inc., *Tampa,* Oslo, 180 rolls newsprint.
Atterbury Bros., Inc., *Tampa,* Drammen, 1,125 bls. chemical pulp.
Atterbury Bros., Inc., *Tampa,* Tofte, 2,850 bls. bleached sulphite.

WILMINGTON IMPORTS

WEEK ENDING AUGUST 12, 1939

Pulp Sales Corp., *Donald McKay,* Wiborg, 2,518 bls. bleached sulphite, 503 tons; 262 bls. wood pulp, 53 tons; 2,128 bls. sulphite, 425 tons.
Jay Madden Corp., *Donald McKay,* Kotka, 1,470 rolls wood pulp boards, 172 tons.
Pulp Sales Corp., *Donald McKay,* Kotka, 350 bls. bleached sulphite, 58 tons.
Pulp Sales Corp., *Donald McKay,* Helsingfors, 390 bls. mechanically ground pulp 78 tons.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 12, 1939

Washington Post, *Markland,* Liverpool, N.S., 1,747 rolls newsprint.
Washington News, *Temnaren,* Hallstavik, 498 rolls newsprint.
Castle & Overton, Inc., *Temnaren,* Wiborg, 659 bls. wood pulp.
F. H. Shallus Co., *Temnaren,* Kotka, 143 rolls newsprint.
Jay Madden Corp., *Temnaren,* Kotka, 986 rolls newsprint.
———, *Temnaren,* Gothenburg, 521 bdls. wall board.
Jay Madden Corp., *Donald McKay,* Kotka, 459 rolls newsprint.
Pulp Sales Corp., *Donald McKay,* Helsingfors, 566 bls. sulphite, 113 tons; 182 bls. mechanically ground pulp, 36 tons.
Bulkley Dunton Pulp Co., Inc., *Donald McKay,* ———, 1,110 bls. dry sulphite, 187 tons.
Pulp Sales Corp., *Ingrid Thorden,* Kemi, 489 bls. sulphate, 1,920 bls. sulphite.
Atterbury Bros., Inc., *Tampa,* Drammen, 675 bls. chemical pulp.
Atterbury Bros., Inc., *Tampa,* Tofte, 4,692 bls., bleached sulphite.
Pagel Horton & Co., Inc., *Etna,* Sweden, 1,625 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING AUGUST 12, 1939

Castle & Overton, Inc., *Temnaren,* Wiborg, 891 bls. wood pulp.
Pulp Sales Corp., *Temnaren,* Wiborg, 376 bls. wood pulp, 136 bls. sulphate.
Bristol Publishing Co., *Temnaren,* Gothenburg, 104 rolls newsprint.
W. M. Stone & Co., *Temnaren,* Kotka, 185 rolls, 273 pkgs. newsprint.
Old Dominion Paper Co., Inc., *Temnaren,* Kotka, 142 pkgs. newsprint.
Pulp Sales Corp., *Temnaren,* Kotka, 1,370 bls. sulphite, 2,415 bls. bleached sulphite.

HOUSTON IMPORTS

WEEK ENDING AUGUST 12, 1939

Darmstadt Scott & Courtney, *Virginia,* Gdynia, 170 bls. rags.

LATEST MARKET REVIEW

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, August 16, 1939.

The moderate expansion of business, deterred by various influences, including the season and the unsettled political situation in Europe, is reassuring to industry and trade. Reports from many manufacturers' representatives, jobbers, and general paper merchants, indicate the expectation of a substantial increase in sales volume, beginning next month.

Reports of general business for the first half of this year indicate that earnings are increasing more rapidly than volume. General business activity in July, as reflected in check payments, was 5.88 per cent higher than in July of last year, while the gain in the volume of business was 10.80 per cent. Business was reported by the Federal Reserve as below the national average in New York, equal to the national average in Massachusetts, the southeast and north central areas. Increased volume was reported in 40 states and declines in 8 states. Reports indicate signs of moderately expanding business and the uptrend has been maintained since the first of July, with the movement of security prices continuing upward.

The index of general business activity stood at 91.1 per cent for the week ended July 29, compared with 91.2 per cent for the previous week and with 83.1 per cent for the corresponding period last year. Paper production of 197 mills was estimated at 79.4 per cent for the week ended August 5, compared with 73.2 per cent for the corresponding week last year. Paper board production for the week of August 5 was 70.0 per cent, compared with 64.0 per cent for the like period last year.

The business prospect in the newsprint division appears more promising in the fall months than at the present time. Consumption continues to slowly improve. Newspaper advertising linage was slightly below last year in the first quarter, with a small gain at the end of June. Advertising schedules for this fall indicate a substantial increase in linage in the future. One of the leading agencies, for example, predicts its own business during the last half of this year would be 20 per cent above the poor second half of last year. Total North American production of newsprint for July was 328,357 tons, compared with 286,796 tons for July 1938. Representative quoted market prices for newsprint continue unchanged.

A slight improvement in sales volume for some grades of paper has been reported this week. The demand covered book paper, some grades of medium quality bond papers, while trade in tissue papers was reported as relatively good. Demand for kraft paper continues at a high level and current orders are running at a high peak and ahead of production. The practice of giving price concessions in the highly competitive bag grades of kraft paper has created a confused and more or less weak market situation. Representative quoted market prices remain unchanged on all grades of wrapping kraft.

Mechanical Pulp

Seasonal dullness continues in the mechanical pulp market. Mill consumption continues at around 80 per cent in some quarters and the trade is looking for an improvement in demand next month. Prices are unchanged and conform to prevailing market quotations.

Chemical Pulp

No important change has been reported in the chemical pulp market for the current week. Prices continue unchanged on all standard grades of imported and domestic pulps. The market position of sulphate pulp continues to be reported as rather weak, which condition is expected to continue until a substantial increase in demand establishes a better balance between consumption and production.

Old Rope and Bagging

Mill buying of old rope continues in the limited volume which has prevailed for many months and no increased activity has been reported in this narrow market during the current week. Prices are unchanged. The demand for old bagging is slow, other than in the roofing grade which continues to be reported in active demand. No price changes have been reported to date.

Rags

Mill buying of domestic white rags continues to be maintained, but other grades are less active, although the market as a whole is firm. No important change from prevailing representative market quotations has been reported this week.

Old Waste Paper

The old waste paper market continues firm, with a good demand reported on No. 1 mixed paper, folded news, and corrugated boxes. Current quotations on No. 1 mixed paper are at from .32½ to .35.

Twine

Little change in sales volume has been reported this week in twine and no important change in the current demand is looked for in the trade until next month. No change in representative market quotations has been reported to date on any grade of hard or soft fiber twine.

G. P. Lee Leaves Eastern Corporation

G. P. Lee, vice-president and sales manager of the Eastern Corporation, 500 Fifth avenue, New York, has severed his connection with the corporation. C. A. Macfarlane, advertising manager has also terminated his connection with the corporation.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, August 16, 1939.

BLANC FIXE—Quotations on blanc fixe continue firm and conform to prevailing market prices. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Prices on bleaching powder continue firm and unchanged at prevailing market quotations. Bleaching powder is currently quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues good. Shipments from Argentina are increasing, current market quotations being the same as the domestic product. Standard domestic casein, 20-30 mesh is quoted at from 11¾ to 12¼ cents; 80-100 mesh, at from 12¼ to 12¾ cents per pound. All prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda remain unchanged at prevailing market levels. Solid caustic soda is currently quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay continue firm and conform to prevailing market quotations. Imported clay is quoted at from $13 to $25 per ton, ship side. Domestic filler clay is currently quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine continue firm and unchanged at prevailing market prices. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The rosin market continues relatively firm under a good demand. "G" gum rosin is currently quoted at $4.75; "FF" wood rosin at $4.55, per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is offered at $2.68 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake continue firm and unchanged at prevailing market quotations. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is offered at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash continue firm and conform to prevailing market prices. Current quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.25.

STARCH—The demand for corn starch continues good with the market less firm at this date. Globe pearl is currently quoted at $2.40 per 100 pounds; special paper starch is offered at $2.50 per 100 pounds; all prices in bags, car lot quantities, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina continue firm and unchanged at prevailing market levels. The commercial grades are offered at $1.15; iron free at $1.30, per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Prices on sulphur continue relatively firm under a good demand. Quotations are unchanged at prevailing market levels. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $10 per ton.

TALC—Prices on talc remain relatively firm and conform to prevailing market levels. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $20 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.12½	@	4.62½
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	$0.82½	@	—
White No. 1 M. G.	.80	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.65	@	—
Colored	.77½	@	—
Kraft	.65	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	2.65	@	—
Bleached Toilet	5.26	@	—
Paper Towels—Per Case			
Unbleached, Jr.	$1.75	@	—
Bleached Jr.	3.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	7.75	@	9.75
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	30.00	@	32.50
Chip	30.00	@	32.50
Sgl. Mla. Ll. Chip	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated	55.00	@	57.50
Kraft Liners	45.00	@	—
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1.	$39.10@	$46.00	$40.25@	$47.25
100% Rag	31.05@	36.50	32.20@	37.75
85% Rag	.....		29.90@	35.00
75% Rag	23.60@	27.75	24.75@	29.00
65% Rag	.....		21.65@	26.25
50% Rag	17.55@	21.50	18.70@	22.75
25% Rag	14.65@	17.75	15.80@	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.60@	$10.50	$9.75@	$12.00
No. 2	7.70@	9.50	8.90@	10.75
No. 3	6.75@	8.25	7.90@	10.00
No. 4	7.00@	8.50	8.20@	10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.30@		$12.75
No. 2 Glossy Coated	9.70@		11.00
No. 3 Glossy Coated	8.60@		10.00
No. 4 Glossy Coated	8.05@		9.25
No. 1 Antique (watermarked)	8.05@		9.25
No. 2 Offset	7.45@		8.50
A Grade E. F.	7.20@		8.25
A Grade S. & S. C.	7.45@		8.50
B Grade E. F.	6.65@		7.75
B Grade S. & S. C.	6.90@		8.00
C Grade E. F.	6.40@		7.50
C Grade S. & S. C.	6.65@		7.75
D Grade E. F.	6.10@		7.00
D Grade S. & S. C.	6.35@		7.25

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	22.50	@	24.00
Dry	22.50	@	24.00
(Delivered)			
No. 1 Domestic and Canadian	29.00	@	33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.25	@	2.75
Prime Qualities— Easy-Bleaching Sulphite	1.90	@	2.00
Strong Unbleached Sulphite	1.70	@	2.00
(On Dock, Atlantic Ports)			
Kraft Bleached	2.50	@	2.75
Kraft Light & Strong	1.50	@	1.60
Kraft No. 1	1.40	@	1.50
Kraft No. 2	1.25	@	1.30
(F. o. b. Pulp Mill)			
Kraft Domestic	1.25	@	1.75
(Delivered)			
Soda Bleached	2.55	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.90	@	7.00
Silesias No. 1	4.50	@	4.75
New Unbleached	6.75	@	7.00
Blue Overall	4.90	@	5.00
Fancy	1.75	@	2.00
Washables	1.50	@	1.60
Mixed Khaki Cuttings	2.25	@	2.30
O. D. Khaki Cuttings	3.25	@	3.40

Old Rags

White, No. 1—			
Repacked	2.90	@	3.15
Miscellaneous	2.10	@	2.25
White, No. 2—			
Repacked	1.50	@	1.60
Miscellaneous	1.25	@	1.40
Thirds and Blues—			
Repacked	1.30	@	1.40
Miscellaneous	1.15	@	1.20
Roofing Rags—			
No. 1	.90		1.00
No. 2	.67½	@	.77½
No. 3 (bagging)	.55	@	.65
No. 4	.60	@	.65
No. 5A	.60	@	.65

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

FARREL ROLLS

GIVE LONG-LIVED TROUBLE-FREE SERVICE

Farrel Rolls have smoothly finished, accurate bodies and journals, scientifically correct shape and amount of crown and a chilled body surface uniform in hardness and depth.

That is why they help in producing top-quality paper and give many years of trouble-free performance at low maintenance cost.

Farrel Rolls are made in chilled iron or extra hard "Farreloy," in any diameter from 4" to 72" and any face length up to 312".

FARREL-BIRMINGHAM COMPANY, INC.
50 State St., Ansonia, Conn.

West Virginia Pulp and Paper Company

230 Park Ave. New York
35 East Wacker Drive Chicago
Public Ledger Building Philadelphia, Pa.
503 Market St. San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT CYLINDER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

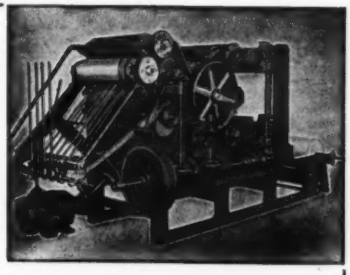
MILLS:
Mechanicville, New York — Tyrone, Pennsylvania
Luke, Maryland — Williamsburg, Pennsylvania
Covington, Virginia — Cass, West Virginia
Charleston, South Carolina

WATERBURY FELTS

Are Made By

H. WATERBURY & SONS CO.
ORISKANY, NEW YORK

A LINE OF MACHINES YOU CAN DEPEND ON



PRINTING PRESSES
Rotary — Multi-color
Oil Ink — Arc-type
Analine — In series
Bag and Notion Envelope

EMBOSSERS
1. Glassine — 4. Tissue
2. Board — 5. Napkin
3. Towel — 6. Wrapping
7. Special Purpose

MISCELLANEOUS
Toilet Roll Wrappers
Vacuum Pumps
Seat Cover Machines
Die Inkers
Core Machines
Core Recutters

FOLDERS
Towel — Wax
Tissue — Facial Tissue
Napkin — Table Covers

WINDERS
Toilet — Crepe
Towels — Jumbo Roll

CREPE MACHINE
Tissue — Kraft
Waterproof

BUNDLING PRESSES
Adjustable — Napkin
Multi-Wall Bag

PAPER CONVERTING MACHINE CO.
GREEN BAY, WISCONSIN
Manufacturers of paper converting machinery for all purposes

CASEIN

Uniform Quality

Dependable Service

Special Types to Meet Unusual Requirements

CASEIN COMPANY OF AMERICA
DIVISION OF THE BORDEN COMPANY
350 Madison Avenue, New York, N. Y.
Over 40 Years of Service to Users of Casein Products

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.60	@	1.75
Domestic	1.50	@	1.60
Wool Tares, light...	1.60	@	1.70
Wool Tares, heavy..	1.80	@	1.90
Bright Bagging.....	1.50	@	1.60
Manila Rope—			
Foreign 2.60	@	2.75	
Domestic	2.75	@	3.00
Jute Threads.....	3.00	@	3.25
Sisal Strings	1.50	@	1.60
Mixed Strings....	.55	@	.60

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.30	@	2.40
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.60	@	1.75
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag	.70	@	.75
Solid Flat Book...	.60	@	.65
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.05	@	1.15
Ledger Stock Colored	.60	@	.70
Manila—			
New Env. Cut....	1.40	@	1.50
New Cuttings.....	1.00	@	1.20
Old Kraft Machine—			
Compressed bales..	.60	@	.65
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue.	.40	@	.45
Strictly Folded....	.37½	@	.40
Corrugated	.45	@	.47½
No. 1 Mixed Paper..	.32½	@	.35

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.12¾	@	.14¾
White Hemp.....	.13¾	@	.15¾
Fine Polished—			
Fine India.....	.16	@	.18
Unpolished—			
Box	.09½	@	—
Paper Makers.....	.09½	@	.10½
Tube Rope.....	.10¼	@	.12½
Wall Paper.....	.10¼	@	.12½
Wrapping	.12	@	—
Soft Fiber Rope...	.12	@	.14
Cotton	.16	@	.19

(Hard Fiber)

Medium Java.....	.11	lb	.17
Mex. Sisal.....	.10	@	.16
Manila	.16	@	.23

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06½
New White, No. 2.	.03½	@	.04
Light Silesias.....	.03½	@	.04
Silesias, No. 1....	—	@	.04½
Black Silesias, soft	.03	@	.03¾
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04	@	.04½
Cottons—According to grades—			
Washable No. 2...	.01	@	.01¾
New Blue.....	.01	@	.01¾
Fancy Percales...	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02½	@	.02¾
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	@	2.25
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1.....	.90	@	1.10
Domestic No. 1...	.80	@	.90
Domestic No. 2...	.60	@	.65
Roofing Bagging...	.40	@	.45

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	—	@	1.50
Domestic	1.50	@	1.60
Manila Rope.....	—	@	3.25
Sisal Rope.....	1.50	@	1.75
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.50
No. 2.....	.80	@	.90
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	.45	@	.50
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 2 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White.	1.75	@	1.80
No. 2 Soft White.	1.30	@	1.40
No. 1 Mixed.....	.65	@	.75
Solid Ledger Stock..	1.45	@	1.50
Ledger Stock, white.	1.10	@	1.15
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.60	@	.65
Manila Cuttings....	1.45	@	1.50
Print Manila.....	.45	@	.50
Container Manila...	.35	@	.40
Kraft Paper.....	.65	@	.70
No. 1 Mixed Paper..	.30	@	.35
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.45	@	.50
Old Newspapers.....	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White.	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.70	@	—
No. 1 Books, light..	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.70	@	1.85
Manila Envelope Cuttings, Extra Quality	2.00	@	2.10
No. 1 Old Manila...	.65	@	.70
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.70	@	.75
Mixed Papers.....	.22½	@	.25
Print Manila	.45	@	.55
Container Manila.....	.32½	@	.35
Old Newspapers.....	.32½	@	.35
Paper Wool Strings..	.60	@	.65
Overissue News.....	.45	@	.50
Box Board Chips....	.25	@	.30
Corrugated Boxes...	.32½	@	.35
Kraft corrugated boxes	.65	@	.75
Screening Wrappers.	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.50	@	2.65
Domestic	2.65	@	2.75
Sisal Rope	1.75	@	1.85
Mixed Rope.....	.45	@	.50
Transmission Rope..	1.80	@	1.90
Soft Jute Rope	2.00	@	2.25
Jute Carpet Threads.	.75	@	.90
Gunny Bagging—			
Foreign	1.50	@	1.65
Domestic	1.35	@	1.40
Bleachery Burlap....	2.50	@	2.70
Scrap Burlap—			
Foreign	1.35	@	1.40
Domestic	1.25	@	1.40
Scrap Sisal.....	1.55	@	1.60
Scrap Sisal for Shredding	1.75	@	1.80
Wool Tares, Heavy..	1.40	@	1.50
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches.	2.00	@	2.10
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging..	.85	@	1.00
No. 2 Bagging.....	.45	@	.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1....	.0675	@	.0690
New Light Flannelettes	.05	@	—
Silesias No. 1.....	.04	@	.04¼
New Black Silesias..	.03½	@	.03¾
Soft Unbleached.....	6.50	@	7.00
Blue Cheviots.....	.05	@	.05¼
Fancy	.02	@	.02½
Washable	.02	@	.02½
Cottons—According to grades—			
Blue Overalls.....	.04¾	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.02½	@	.03
O. D. Khaki.....	.03	@	.03¼
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B. V. D. Cuttings...	.06¾	@	.07

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04¼	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Old Blue Overalls...	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.65	@	.70
No. 3.....	.45	@	.50

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	.90	@	1.00
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments.	2.10	@	2.25
New Silesias.....	3.75	@	4.00

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White .	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.20
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White $35.50	@	—	
No. 1 Tints 36.50	@	—	
No. 2 White 25.50	@	—	
No. 2 Tints 26.50	@	—	
No. 2 Golden Rod.. 27.50	@	—	
No. 3 White 21.00	@	—	
No. 4 White 15.00	@	—	
No. 4 Tints 16.00	@	—	
No. 4 Golden Rod... 17.00	@	—	
Direct mill shipment in three-ton lots			
No. 5 White $10.50	@	—	
No. 5 Tints 11.50	@	—	
No. 5 Golden Rod.. 12.00	@	—	
No. 6 White 9.00	@	—	
No. 6 Tints 9.50	@	—	
No. 6 Golden Rod.. 11.00	@	—	
No. 7 White 8.00	@	—	
No. 7 Tints 8.50	@	—	
No. 7 Golden Rod.. 10.00	@	—	
Book—			
No. 1 M. F. $7.00	@	—	
No. 2 M. F. 6.50	@	—	
No. 3 M. F. 5.35	@	—	
No. 1 S. C. 7.25	@	—	
No. 2 S. C. 6.75	@	—	
No. 3 S. C. 5.85	@	—	

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$12.00	@	—	
No. 2 ..... 10.25	@	—	
No. 3 ..... 8.90	@	—	
Coated tinted 13.00	@	—	
Wrapping—delivered—			
Rag Brown..... 4.85	@	5.25	
White Wrap..... 4.00	@	—	
"B" Manila..... 4.90	@	6.15	
No. 1 Manila..... 5.50	@	6.90	
Fiber 5.50	@	6.90	
Kraft No. 2..... 5.50	@	6.90	

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..)46.00	@	—	
Sheets 54.00	@	—	

Pulp

Ground wood.....$29.00	@	—	
Unbleached sulphite. 44.00	@	—	
Bleached sulphite... 54.00	@	—	
Kraft 50.00	@	—	
Soda 54.00	@	—	

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.00	@	—
Soft White.....	1.75	@	—
White Blk. News..	1.25	@	1.10
Book and Ledger—			
Flat Magazine and Book Stock (old)	.70	@	—
Light and Crumpled Book Stock.	.60	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f.o.b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Light Prints.....	.03	@	.03¼